LONDON SCHOOL OF TROPICAL MEDICINE
NOT TO BE TAKEN AWAY.

THE FAUNA OF BRITISH INDIA,

INCLUDING

CEYLON AND BURMA.

Published under the Authority of the Secretary of State for India in Council.

EDITED BY W. T. BLANFORD.

REPTILIA and BATRACHIA.

BY

GEORGE A. BOULENGER.

LONDON:
TAYLOR AND FRANCIS, RED LION COURT, FLEET STREET.

CALCUTTA:
THACKER, SPINK, & CO.

BOMBAY:
THACKER & CO., LIMITED.

BERLIN:
R. FRIEDLÄNDER & SOHN, 11 CARLSTRASSE.

1890.

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3314

ALERE FLAMMAM.

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

Two classes of Vertebrata, the Reptiles and the Batrachians or Amphibians, are described in this volume of the 'Fauna of British India.' These two classes have often been associated in zoological works, and were, by many writers, until recently, not regarded as distinct. The study of both is usually prosecuted by the same observers, and no practical advantage would result from publishing the descriptions of the two separately.

Mr. Boulenger, to whom Indian naturalists are indebted for the present work, has already classified and described all known Crocodiles, Tortoises, Lizards, Chamæleons, and Batrachians in Catalogues of the British Museum that have appeared during the last eight years. Many of the characters of genera and species now published are taken from those Catalogues, but numerous additions have been made and several alterations have been inserted. Wherever the complete synonymy is given in the Catalogues it has been considered unnecessary, in the present work, to insert more than a reference to the original description of the species, to the page in the British Museum Catalogue where full details can be found, and to the general works on Indian Reptiles by Günther and Theobald.

The classification of the Snakes, which comprise nearly one half of the Reptilian species known to occur in India, is new, and all the descriptions of families, genera, and species have been prepared expressly for the present work. As there is no recent publication with a complete synonymy of the Ophidia, somewhat fuller references to the literature of the subject have been rendered necessary than in the other suborders of Reptiles and Batrachians.

Two general works on Indian Reptiles have been published before the present volume. The first was 'The Reptiles of British India,' by Dr. A. Günther, which appeared in quarto and was issued by the Ray Society in 1864; and the second, an octavo 'Descriptive Catalogue of the Reptiles of British India,' by Mr. W. Theobald, published in 1876. In the first, which was founded on the earlier publications of Russell, Cantor, Gray, Blyth, Jerdon, Kelaart, and others, largely supplemented by the author's own researches, the Batrachia were included; but both the Batrachia and the Hydrophiinæ or marine snakes were omitted in Mr. Theobald's book, a great part of which was virtually an abridgment of Günther's, but with the numerous discoveries and observations of Stoliczka, Beddome, Anderson, and of the author himself added to those of Günther, many additions by the latter having been made after the publication of his large work on Indian Reptiles. In the present volume the principal additions have been due to the collections of Beddome in Southern India, Fea and Davison in Burma, and of Murray and the Editor of this work in Western India and Baluchistan.

The limits of the fauna described in Günther's 'Reptiles of British India' were wider than those adopted in Theobald's work and in the present, and comprised all South-eastern Continental Asia. The area here accepted as that of the 'Fauna of British India' has been defined in the Introduction to the Mammalia of the present series, and may be briefly

described as British India with Burma and all other dependencies, and with the addition of Ceylon—Baluchistan, Kashmir, Ladák, and all Cis-Himalayan States being included, and Afghanistan, Tibet Proper, China, Siam, and the Malay Peninsula south of Tenasserim excluded.

The following comparison of the number of species described, from within the limits adopted in the present work, in Günther's 'Reptiles of British India' with those enumerated in Theobald's Catalogue and in the present volume will serve roughly to indicate the additions to our knowledge of the Reptilia and Batrachia of India in the last quarter of a century. As already noticed, one subfamily of Snakes, the Hydrophiinæ, was omitted by Theobald.

	Günther, 1864.	Theobald, 1876.	Boulenger, 1890.
REPTILIA.			
Emydosauria (Crocodiles)	4	4	3
Chelonia (Tortoises & Turtles) ..	30	54	43
Squamata.			
Lacertilia (Lizards)	95	173	225
Rhiptoglossa (Chamæleons) ..	1	1	1
Ophidia (Snakes)	180	225	264
	310	457	536
BATRACHIA.			
Ecaudata (Frogs and Toads)..	37	..	124
Caudata (Newts &c.)........	0	..	1
Apoda (Cæcilians)..........	2	..	5
	39		130

In cases where the numbers have been reduced the reduction is due to the union of species formerly supposed to be distinct. The additions in the present volume are much more numerous than the preceding comparison indicates.

By permission of the Trustees of the British Museum, through the kindness of Professor Flower and Dr. Günther,

several figures from the Catalogues of the National Collection prepared by Mr. Boulenger and from the Guide to the Reptile Gallery have been inserted in the present work. One cut has also, by permission of the Zoological Society, been taken from its 'Proceedings.'

The Fishes, Reptiles, and Batrachians of the 'Fauna of British India' have now appeared, with one volume of Birds and half a volume of Mammals, leaving two volumes of Birds and half a volume of Mammals still in hand.

W. T. BLANFORD.

July, 1890.

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REPTILIA.

Reptiles may be briefly defined as cold-blooded Vertebrates breathing by lungs throughout their existence, and having the body covered with scales or scutes. A basioccipital bone is present in the skull, which articulates with the vertebral column by a single condyle.

The class Reptilia is divided into a considerable number of Orders, which are, however, mostly extinct. Recent Reptiles belong to four Orders, viz.:—

I. EMYDOSAURIA, Crocodiles.

II. CHELONIA, Tortoises and Turtles.

III. SQUAMATA, Lizards and Snakes.

IV. RHYNCHOCEPHALIA, a primitive type, probably ancestral to the three others, and of which a single existing representative is known, the Tuatera of New Zealand.

Order I. EMYDOSAURIA.

Quadrate bone immovably united to cranial arches; two horizontal bony temporal arches. Cervical and dorsal ribs mostly two-headed, the middle dorsals articulating with the transverse processes of the neural arch. Sternum and interclavicle present; seven or eight transverse series of "abdominal ribs," not connected with the vertebral ribs, each series composed of four ossicles, and forming an angle directed forwards. Teeth present in the jaws, implanted in alveoli. Ventricle of the heart divided by a complete septum. Pectoral and abdominal cavities separated from each other by a muscular diaphragm. Anal opening longitudinal. Copulatory organ present, single.

Family I. CROCODILIDÆ.

Nares anterior; choanæ opening far back between the pterygoids, which, like the palatines and maxillaries, are produced into osseous plates joining on the median line of the palate; orbit communicating with the infratemporal fossa. Vertebræ procœlous; ribs with uncinate processes. No clavicles. Pubis excluded from acetabulum. Manus with five well-developed digits, pes with four. A dorsal armour of bony scutes. Ears with movable opercles.

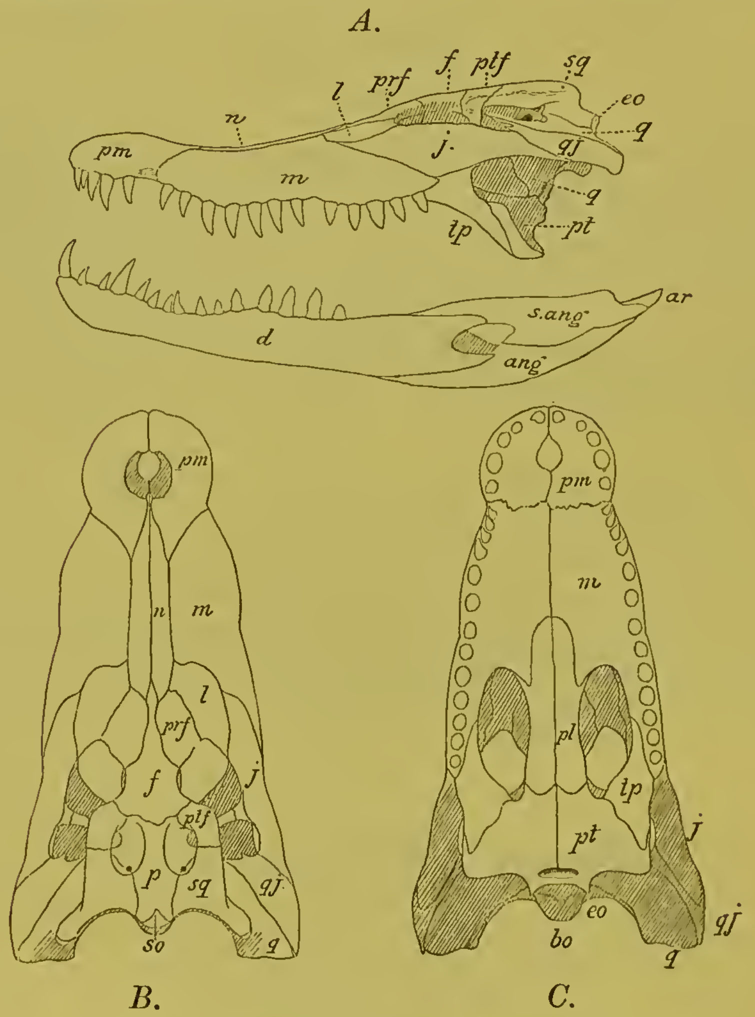

Fig. 1.—Skull of *Crocodilus palustris*.

A. Side view. *B.* Upper view. *C.* Lower view.

ang. Angular.
ar. Articular.
bo. Basioccipital.
d. Dentary.
eo. Exoccipital.
f. Frontal.
j. Jugal.
l. Lachrymal.
m. Maxillary.
n. Nasal.
p. Parietal.
pl. Palatine.
pm. Præmaxillary.
prf. Præfrontal.
pt. Pterygoid.
ptf. Postfrontal.
q. Quadrate.
qj. Quadratojugal.
s.ang. Supra-angular.
so. Supraoccipital.
sq. Squamosal.
tp. Transpalatine.

Tongue entirely attached to the floor of the mouth. Pupil vertical. Only the three inner digits clawed.

The Crocodiles are at the same time the most highly organized and the largest of existing Reptiles. They are thoroughly aquatic and carnivorous. Their eggs, which have a hard shell, are deposited on the banks of the water, in a hollow slightly covered up with sand.

23 or 24 living species are known from Africa, Southern Asia to the Yang-tse-Kiang, North Australia, and the tropical and warm parts of America. In the fauna with which the present work deals, Crocodiles are represented by two genera, thus distinguished:—

Snout extremely elongate; 27 teeth or more on each side of upper jaw	GAVIALIS, p. 3.
Snout moderate; 17 to 19 teeth on each side of upper jaw................................	CROCODILUS, p. 4.

Genus GAVIALIS,

Oppel, Ordn. Rept. p. 19, 1811.

27 to 29 upper and 25 or 26 lower teeth on each side, anterior largest, laterals subequal, not received into interdental pits; the first, second, and third mandibular teeth fitting into notches in the upper jaw. Snout extremely narrow and elongate, dilated at the end; nasal bones comparatively short, widely separated from the præmaxillaries; nasal opening smaller than the supratemporal fossæ; lower anterior margin of orbit (jugal) raised. Mandibular symphysis extremely long, extending to the 23rd or 24th tooth, comprising the splenial bones. A dorsal shield formed of four longitudinal series of juxtaposed, keeled, bony scutes.

A single species, only found in rivers.

1. Gavialis gangeticus.

Lacerta gangetica, *Gmel. Syst. Nat.* i, p. 1057.
Gavialis gangeticus, *Günth. Rept. B. I.* p. 63; *Bouleng. Cat. Chel. &c.* p. 275.
Gharialis gangeticus, *Theob. Cat.* p. 37.

Snout $3\frac{1}{3}$ (adult) to $5\frac{1}{2}$ times (young) as long as broad at the base. Nuchal and dorsal scutes forming a single continuous shield, composed of 21 or 22 transverse series; an outer row of soft, smooth or feebly-keeled scutes in addition to the bony dorsal scutes; two small postoccipital scutes. Median fingers one-third, outer toes two-thirds webbed. A strong crest on the outer edge of the forearm, leg, and foot. Adult dark olive above; young pale olive, with dark brown spots or cross-bands.

Hab. Indus, Ganges, and Brahmaputra rivers and their larger tributaries; also Mahánadi of Orissa, and Koladyne river, Arrakan, but not the Nerbudda, Tapti, Godávari, Kistna, Irrawaddy, or other rivers of India or Burma.

The Gharial reaches a length of 20 feet; it feeds entirely upon fish, for seizing which its narrow jaws are specially adapted.

Genus CROCODILUS,

Laur. Syn. Rept. p. 53 (part.), 1768.

17 to 19 upper and 15 lower teeth on each side; fifth maxillary tooth largest; the fourth mandibular usually fitting into a notch in the upper jaw. Snout more or less elongate; nasal bones extending to the nasal aperture, which is undivided and larger than the supratemporal fossæ. Splenial bones not entering the mandibular symphysis, which does not extend beyond the eighth tooth. A dorsal shield formed of four or more longitudinal series of juxtaposed, keeled, bony scutes.

Distribution. Africa, Southern Asia, North Australia, Tropical America.

11 or 12 species appear to be well established.

Synopsis of Indian Species.

Snout* $1\frac{2}{3}$ to $2\frac{1}{4}$ times as long as broad .... *C. porosus*, p. 4.
Snout $1\frac{1}{3}$ to $1\frac{1}{2}$ times as long as broad .... *C. palustris*, p. 5.

2. Crocodilus porosus.

Crocodilus porosus, *Schneid. Hist. Amph.* ii, p. 159; *Günth. Rept. B. I.* p. 62; *Theob. Cat.* p. 36; *Bouleng. Cat. Chel. &c.* p. 284.
Oopholis pondicherianus, *Gray, A. M. N. H.* (3) x, 1862, p. 268.
Crocodilus pondicerianus, *Günth. Rept. B. I.* p. 62, pl. vii; *Theob. Cat.* p. 36.

17 to 19 upper teeth on each side. Snout $1\frac{2}{3}$ to $2\frac{1}{4}$ times as long as broad at the base; head rough, snout with a more or less strong ridge on each side in front of the eye, slightly converging towards its fellow; mandibular symphysis extending to the fifth tooth; præmaxillo-maxillary suture, on the palate, directed backwards or W-shaped; nasal bones separating the præmaxillaries above. Four large nuchal scutes forming a square, with one or two smaller ones on each side; postoccipital scutes usually absent, sometimes small and irregular. Dorsal shield well separated from the nuchal, the scutes forming 16 or 17 transverse and 4 to 8 longitudinal series; scales on sides and limbs smooth or feebly keeled. Fingers webbed at the base; outer toes extensively webbed. A serrated fringe on the outer edge of the leg. Adult dark olive above; young pale olive, with large black spots on the body and tail and dots on the head.

Hab. Bengal, East coast of India, Ceylon, Burma, and Southern China to North Australia and the Solomon and Fiji Islands. Entering salt water and frequently occurring out at sea. Not recorded from West coast of India. It is not certain that this species is found far above the tideway in rivers.

A specimen 33 feet long is on record.

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* The snout is the portion of the head in front of the orbits.

3. Crocodilus palustris.

Crocodilus palustris, *Lesson in Bélang. Voy. Ind. Or., Zool.* p. 305; *Kelaart, Prodr.* p. 183; *Günth. Rept. B. I.* p. 61, pl. viii, fig. A; *Theob. Cat.* p. 36; *Bouleng. Cat. Chel. &c.* p. 285.
Crocodilus trigonops, *Gray, Cat. Tort. &c.* p. 62.

19 upper teeth on each side. Snout $1\frac{1}{3}$ to $1\frac{1}{2}$ as long as broad at the base; head rough but without any ridges; mandibular symphysis extending to the level of the fourth or fifth tooth; præmaxillo-maxillary suture, on the palate, transverse, nearly straight, or curved forwards; nasal bones separating the præmaxillaries above. Four large nuchals forming a square, with a smaller one on each side; two pairs of smaller nuchals on a transverse series behind the occiput. Dorsal shield well separated from the nuchal, the scutes usually in 4, rarely in 6, longitudinal series, those of the two median usually considerably broader than long; 16 or 17 transverse series. Scales on limbs keeled. Fingers webbed at the base; outer toes extensively webbed. A serrated fringe on the outer edge of the leg. Adult blackish olive above; young pale olive, dotted and spotted with black.

The largest specimen in the British Museum measures 12 feet, but individuals are said to grow much larger.

Hab. India, Ceylon, Burma, Malay Peninsula and Archipelago. This is the common Crocodile of India, found in rivers, marshes, and ponds, and extending west to Sind and Baluchistan.

This species is easily distinguished from *C. porosus* by its shorter snout and by the presence of five teeth in each præmaxillary bone, whilst the adult of the latter has but four.

Order II. CHELONIA.

Quadrate bone immovably united to cranial arches. Dorsal ribs single-headed, the anterior attached between two vertebræ. Body encased in a bony shell. A plastron formed of a small number of elements in addition to the clavicles. No sternum. No teeth; jaws covered with horny sheaths. Anal opening round or longitudinal. Copulatory organ present, single.

Oviparous; eggs with a hard shell, except in the *Chelonidæ*.

The Tortoises and Turtles of India fall into five Families*.

Suborder I. *THECOPHORA*.

Dorsal vertebræ and ribs immovably united and expanded into bony plates forming a carapace. Parietals prolonged downwards towards the pterygoids.

Superfam. A. TRIONYCHOIDEA.

Articulation between the last cervical and the first dorsal vertebra by the zygapophyses only. Marginal bones absent or forming an incomplete series.

Carapace and plastron without epidermal shields, covered with a soft skin .... Fam. 1. **Trionychidæ.**

Superfam. B. CRYPTODIRA.

Centrum of the last cervical vertebra articulating with the centrum of the first dorsal. A complete series of marginal bones, connected with the ribs.

Digits short; tail short, with procœlous vertebræ .... Fam. 2. **Testudinidæ.**

Digits short; tail long; caudal vertebræ mostly opisthocœlous .... Fam. 3. **Platysternidæ.**

Limbs paddle-shaped, with only one or two claws. Marine .... Fam. 4. **Chelonidæ.**

Suborder II. *ATHECÆ*.

Vertebræ and ribs free, separated from a bony exoskeleton. Skull without descending processes of the parietal bones.

Limbs paddle-shaped, clawless. Marine.... Fam. 5. **Sphargidæ.**

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* These five families, so far as Indian genera are concerned, may be recognized from external characters by use of the following key:—

Limbs with four or five claws.
- Tail short .... **Testudinidæ.**
- Tail nearly as long as the shell .... **Platysternidæ.**

Limbs with three claws .... **Trionychidæ.**
Limbs with one or two claws .... **Chelonidæ.**
Limbs without claws.. **Sphargidæ.**

For the illustration of the osteological characters employed in the systematic arrangement, the following figures are appended of a skull, and of a shell stripped of the horny epidermal shields.

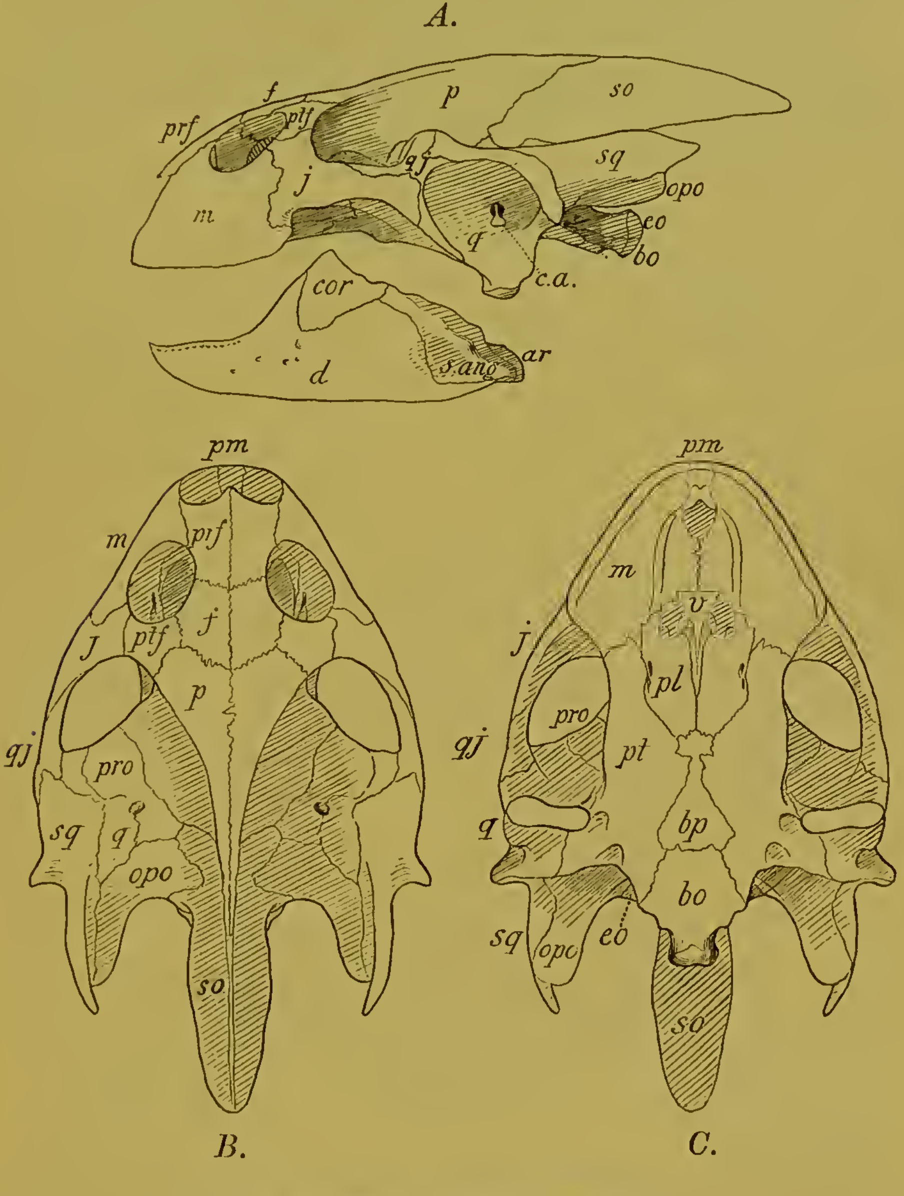


Fig. 2.—Skull of *Trionyx gangeticus.*

A. Side view. B. Upper view. C. Lower view.

ar.	Articular.	*j.*	Jugal.	*pt.*	Pterygoid.
bo.	Basioccipital.	*m.*	Maxillary.	*ptf.*	Postfrontal.
bp.	Basiphenoid.	*opo.*	Opisthotic.	*q.*	Quadrate.
c.a.	Columella auris.	*p.*	Parietal.	*qj.*	Quadratojugal.
cor.	Coronoid.	*pl.*	Palatine.	*s.ang.*	Supra-angular.
d.	Dentary.	*pm.*	Præmaxillary.	*so.*	Supraoccipital.
eo.	Exoccipital.	*prf.*	Præfrontal.	*sq.*	Squamosal.
f.	Frontal.	*pro.*	Prootic.	*v.*	Vomer.

The arrangement of the bones or *plates* of the shell, as shown in fig. 3, differs entirely from that of the overlying *shields*, both in the upper shell (*carapace*) and lower (*plastron*); but the impressions of the shields are nearly always distinct, as represented in figures 8, 9, 10, 11, 12, 14. In these figures crosses are inserted to indicate the position of the anterior (axillary) and posterior (inguinal) processes or buttresses of the plastron, which, if present, anchylose with the lower surface of the carapace. Figure 4 refers to the terminology of the epidermal shields.

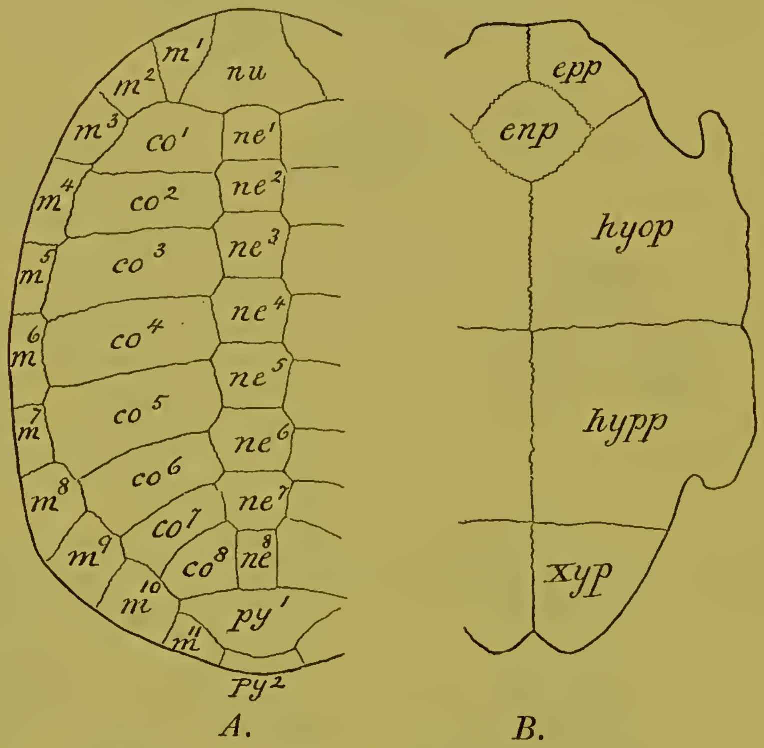


Fig. 3.—Shell of *Morenia ocellata*, showing bony plates.

A. Carapace. B. Plastron.

co. Costal.
enp. Entoplastron.
epp. Epiplastron.
hyop. Hyoplastron.
hypp. Hypoplastron.
m. Marginal.
ne. Neural.
nu. Nuchal.
py. Pygal.
xyp. Xiphiplastron.

The investigation of the bony plates presents no great difficulty, and need not cause the slightest damage to the specimen, whether dry or preserved in spirit; for the removal of one or two epidermal shields with a penknife requires but a little care, and after the examination the horny shields may be stuck on again with gum which is not soluble in alcohol. There is much greater variety, apart from individual variations, in the disposition of the bony plates than in that of the overlying shields, and much greater profit is to be derived from the study of the former in determining the relationship of genera of Tortoises.

The connexion between the carapace and plastron is called the *bridge.*

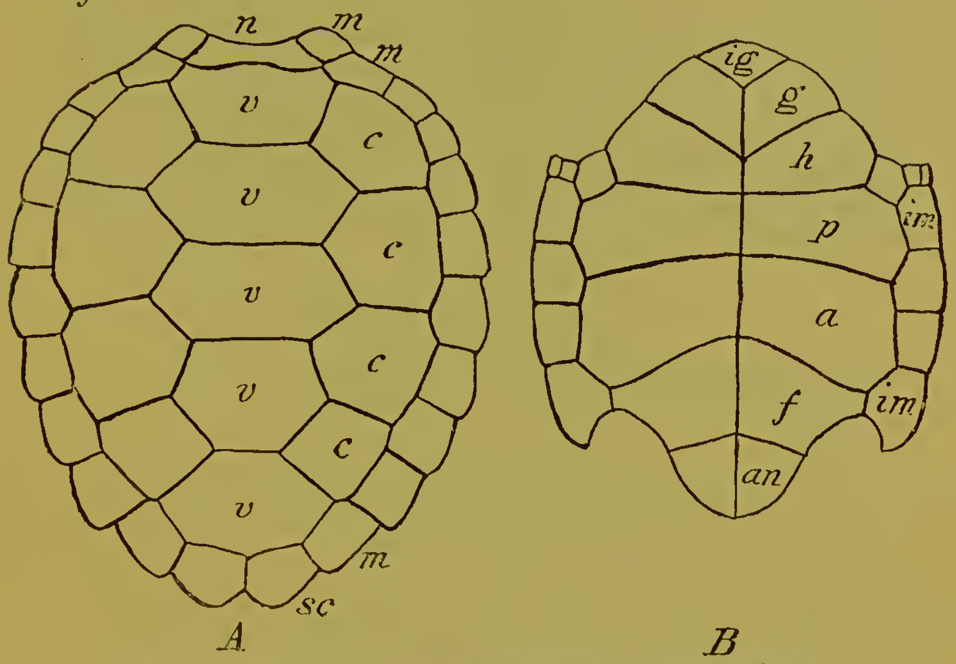


Fig. 4.—Shell of *Chelone mydas*, with epidermal horny shields.
A. Carapace B. Plastron.

a. Abdominal. *h.* Humeral. *n.* Nuchal.
an. Anal. *ig.* Intergular. *p.* Pectoral.
c. Costal. *im.* Inframarginal. *sc.* Supracaudal.
f. Femoral. *m.* Marginal. *v.* Vertebral.
g. Gular.

The anterior inframarginal is also termed *axillary*, and the posterior *inguinal.*

Suborder I. *THECOPHORA.*

Superfam. A. **TRIONYCHOIDEA.**

Neck bending by a sigmoid curve in a vertical plane; cervical vertebræ without well-developed transverse processes; articulation between the last cervical and the first dorsal vertebra by the zygapophyses only. Mandible with articulary concavity; outer border of tympanic cavity notched; pterygoids not narrowed posteriorly, separated from each other, the basisphenoid joining the palatines. Pelvis not anchylosed to the carapace and plastron. Fourth digit with four or more phalanges. Epiplastra separated from the hyoplastra by the Λ-shaped entoplastron. Marginal bones absent or forming an incomplete series, not connected with the ribs.

Family I. TRIONYCHIDÆ.

Carapace and plastron without epidermal shields, covered with a soft skin. Jaws concealed under fleshy lips; snout ending in a proboscis. Head and neck completely retractile. Ear hidden. Only the three inner digits clawed. Tail very short.

Distribution. Rivers of Asia, Africa, and North America. Of the six known genera, four are represented in the Indian Region.

The Trionychoids are thoroughly aquatic Turtles, living chiefly in rivers; *Pelochelys* even enters the sea. Specimens of *Emyda*, however, are occasionally found at some distance from water, according to the observations of Kelaart and Blanford. All are carnivorous, and their ferocious habits, together with the extreme rapidity with which they project their necks, render the larger individuals dangerous to men bathing. Of no commercial value.

Synopsis of Indian Genera.

A. Plastron without cutaneous valves; hyoplastron distinct from hypoplastron; no marginal ossifications.
  a. Orbit nearer the temporal than the nasal fossa; bony choanæ between the orbits.......... TRIONYX, p. 10.
  b. Orbit nearer the nasal than the temporal fossa; bony choanæ between the orbits.......... PELOCHELYS, p. 15.
  c. Orbit nearer the nasal than the temporal fossa; bony choanæ behind the orbits .... CHITRA, p. 16.
B. Plastron with a cutaneous femoral valve, under which the hind limb may be concealed; hyoplastron coossified with hypoplastron; marginal bones present .... EMYDA, p. 16.

Genus TRIONYX,

Geoffr. Ann. Mus. xiv, 1809, p. 1 (part.).

Outer extremities of the nuchal plate overlying the second dorsal rib; neural plates well developed. Limbs completely exposed. Hyoplastron distinct from hypoplastron; not more than five plastral callosities. Bony choanæ between the orbits; jaws strong; postorbital arch narrower than the diameter of the orbit; posterior border of pterygoids free, without ascending process.

Distribution. Africa, Asia, North America.

15 species are recognized, 7 of which are found in India and its dependencies. The dimensions given are those of specimens in the British Museum; individuals may be found considerably larger, some attaining probably 5 feet in length of carapace.

Synopsis of Indian Species.

A. All the costal plates separated on the median line by the neural plates; head very large . *T. subplanus*, p. 11.
B. Last pair of costal plates in contact on the median line.
  a. Two neural plates between the first pair of costals; alveolar surface of lower jaw without a strong longitudinal ridge at the symphysis.

a'. Inner edge of alveolar surface of mandible strongly raised, forming a sharp ridge, which sends off a short perpendicular process at the symphysis; interorbital space, in the adult skull, narrower than the external nasal opening; head with oblique black lines, converging forwards; no ocellar spots .... *T. gangeticus*, p. 12.

b'. Inner edge of alveolar surface of mandible not or but very slightly raised, symphysis flat or with a longitudinal furrow; interorbital space narrower than the external nasal opening; head with oblique black lines, converging forwards; young with small ocellar dorsal spots .... *T. leithii*, p. 12.

c'. Inner edge of alveolar surface of mandible not or but very slightly raised, symphysis flat or with a longitudinal furrow; interorbital space, in the adult skull, broader than the external nasal opening; head black-marbled, with a large yellow spot behind each eye; young with large ocellar dorsal spots. . *T. hurum*, p. 13.

b. A single neural plate between the first pair of costals; alveolar surface of lower jaw with a strong longitudinal symphysial ridge.

a'. Epiplastra widely separated from each other; plastral callosities well developed and largely pitted .... *T. formosus*, p. 14.

b'. Epiplastra in contact in front of the entoplastron; plastral callosities very feebly developed, finely sculptured .... *T. phayrii*, p. 14.

c'. Epiplastra in contact in front of the entoplastron; plastral callosities well developed and largely pitted .... *T. cartilagineus*, p. 15.

4. Trionyx subplanus.

Trionyx subplanus, *Geoffr. Ann. Mus.* xiv, 1809, p. 11, pl. v, fig. 2; *Günth. Rept. B. I.* p. 49; *Bouleng. Cat. Chel. &c.* p. 246.
Dogania güntheri, *Gray, P. Z. S.* 1862, p. 265.
Trionyx güntheri, *Günth. Rept. B. I.* p. 49, pl. vi, fig. A.

Carapace very flat; costal plates eight pairs, the last well developed and separated by the last neural plate; a single neural between the first pair of costals; these plates very finely granulate and vermiculate; a large fontanelle, till late in life, between the nuchal and dorsal plates. Epiplastra narrowly separated from each other in front of the entoplastron, which forms an obtuse or a right angle; plastral rugosities scarcely developed, on the hyo- and hypoplastra and on the xiphiplastra. Dorsal skin of young with interrupted longitudinal ridges. Head very large; snout (on the skull) about as long as the diameter of tho orbit, which is more than double the interorbital width; postorbital arch extremely

narrow, forming a keel on its outer surfaee; mandibular symphysis shorter than the diameter of the orbit, without median ridge. Brown above, yellowish beneath and on the sides of the neck; head and neck with yellowish dots; some young with an oblique dark streak behind each eye.

Length of dorsal disk 10 inehes.

Hab. Mergui, Malay Peninsula, Sumatra, Borneo, Java.

5. Trionyx gangeticus.

Trionyx gangeticus, *Cuvier, Oss. Foss.* v, pt. 2, pp. 186, 222, pl. xi, figs. 5–8; *Bouleng. Cat. Chel. &c.* p. 248.
Trionyx javanicus (*non Geoffr.*), *Gray, Ill. Ind. Zool.* ii, pl. lxv; *Günth. Rept. B. I.* p. 48.
Aspilus gataghol, *Gray, A. M. N. H.* (4) x, 1872, p. 339.
Trionyx gangeticus, part., *Theob. Cat.* p. 28.

Costal plates eight pairs, the last well developed and in contact throughout on the median line; two neurals between the first pair of costals; plates coarsely pitted and vermieulate. Epiplastra narrowly separated from eaeh other in front of the entoplastron, which forms an obtuse or a right angle; plastral callosities very large, hyo-hypoplastral, xiphiplastral, and, in old specimens, entoplastral. Dorsal skin of young with longitudinal ridges of small tubercles. Head moderate; snout (on the skull) about as long as the diameter of the orbit; interorbital region, in the adult, considerably narrower than the nasal fossa; postorbital arch one third to one half the greatest diameter of the orbit; mandible with the inner edge strongly raised, forming a sharp ridge, which sends off a short perpendicular proeess at the symphysis; the diameter of the mandible at the symphysis does not exceed the diameter of the orbit. Olive above; baek of young vermieulated with fine black lines, but without ocelli; head with a black longitudinal streak from between the eyes to the nape, intersected by two or three Λ-shaped blaek streaks; lower parts yellowish.

Length of dorsal disk 2 feet.

Hab. Gangetie river-system; Indus?

6. Trionyx leithii.

Trionyx leithii, *Gray, A. M. N. H.* (4) x, 1872, p. 334; *Bouleng. Cat. Chel. &c.* p. 249.
? Trionyx gangeticus, *Murray, Zool. Sind,* p. 342.

Intermediate between *T. gangeticus* and *T. hurum*. Agrees with the former in the width of the interorbital space, the comparatively short mandibular symphysis, and the markings of the head; with the latter in the longer and more pointed snout, the absenee of a strong ridge on the inner alveolar surface of the mandible, and in the presence, in the young, of four or more dorsal oeelli, which are, however, smaller than in *T. hurum*.

Hab. Kistna River, Deccan, and Nelambar River, Malabar.

This will probably prove to be a Peninsular form, ranging from the Indus to Madras and Malabar.

7. Trionyx hurum.

Trionyx hurum, *Gray, Syn. Rept.* p. 47, pl. x; *id. Ill. Ind. Zool.* ii, pl. lxvi; *Bouleng. Cat. Chel. &c.* p. 249.
Trionyx ocellatus, *Gray, Ill. Ind. Zool.* i, pl. lxxviii; *Theob. P. A. S. B.* 1875, p. 174, pl. iv; *id. Cat.* p. 29.
Trionyx gangeticus, *Günth. Rept. B. I.* p. 47.
Trionyx buchanani, *Theob. P. A. S. B.* 1874, p. 78.
Trionyx gangeticus, part., *Theob. Cat.* p. 28.

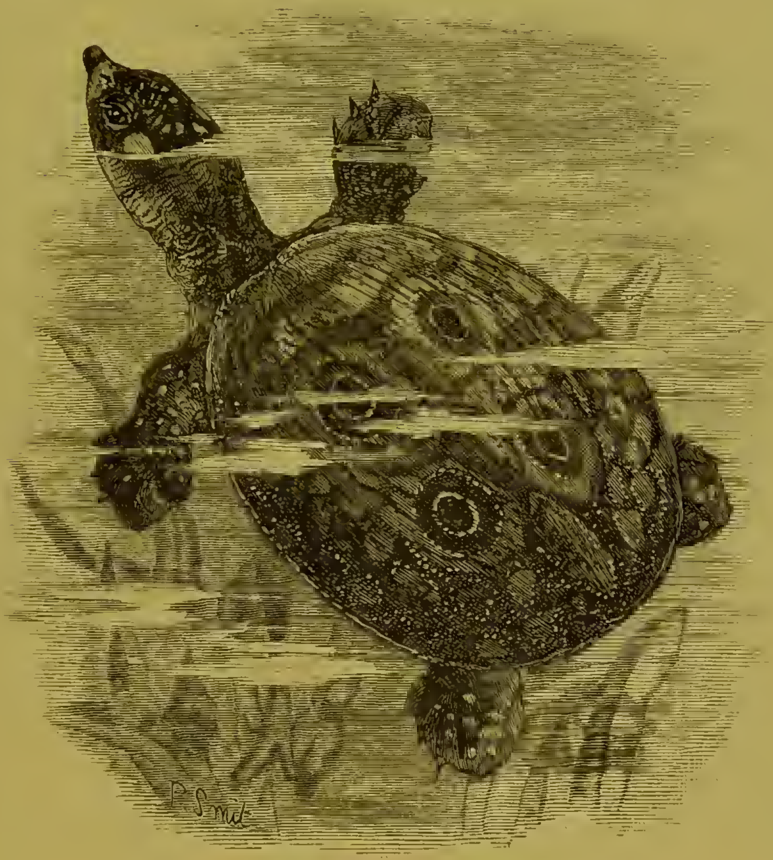


Fig. 5.—*Trionyx hurum* (young).

Costal plates eight pairs, the last well developed and in contact throughout on the median line; two neurals between the first pair of costals; plates coarsely pitted and vermiculate. Epiplastra narrowly separated from each other in front of the entoplastron, which forms an obtuse or a right angle; plastral callosities very large, hyo-hypoplastral, xiphiplastral, and in old specimens entoplastral. Dorsal skin of young with longitudinal ridges of small tubercles. Head moderate; snout (on the skull) a little longer than the diameter of the orbit; interorbital region, in the adult, as broad as the nasal fossa; postorbital arch somewhat more than half the diameter of the orbit in the adult; mandible without strongly raised inner edge or longitudinal symphysial ridge; the diameter of the mandible at the symphysis exceeds the diameter of the orbit. Olive-brown above and beneath; head, neck, limbs, and

border of shell light-dotted; head with large yellow spots, viz. across the snout, behind the orbit, at the angle of the mouth, on the tympanic region, and on the chin; these spots become indistinct in the adult, the head of which is more or less closely spotted or vermiculated with black; dorsal disk in the young with dark marblings and four or six very large ocelli.

Length of dorsal disk 16 inches.

Hab. Ganges and its tributaries.

8. Trionyx formosus.

Trionyx formosus, *Gray, P. Z. S.* 1869, p. 217, pl. xv, fig. 1; *Theob. Cat.* p. 31; *Bouleng. Cat. Chel. &c.* p. 250.
Trionyx peguensis, *Gray, Suppl. Cat. Sh. Rept.* i, p. 99; *Theob. Cat.* p. 31.
Trionyx grayii, *Theob. P. A. S. B.* 1875, p. 176, pl. iii; *id. Cat.* p. 31.

Costal plates eight pairs, the last well developed and in contact throughout on the median line; a single neural between the first pair of costals; plates coarsely pitted and vermiculate. Dorsal skin of young with longitudinal ridges of small tubercles. Epiplastra separated from each other; entoplastron forming an obtuse or right angle; plastral callosities well developed, hyo-hypoplastral and xiphiplastral, and coarsely sculptured like the carapace. Head moderate; snout (on the skull) about as long as the diameter of the orbit; interorbital region, in the adult, as broad as the nasal fossa; postorbital arch, in the adult, a little less than half the diameter of the orbit; mandible with a strong ridge along the symphysis, the diameter of which equals or a little exceeds that of the orbit. Olive-brown above, white below; head of young ornamented with yellow black-edged markings, the largest being a cross-band on each side of the back of the head; these markings disappear in the adult, the head of which is closely spotted with black above and uniform white inferiorly; young with four large dorsal ocelli, as in *T. hurum.*

Size of *T. hurum.*

Hab. Irrawaddy, Sittoung, and Salween rivers, Burma.

9. Trionyx phayrii.

Trionyx phayrei, *Theob. Journ. Linn. Soc.* x, 1868, p. 18; *id. Cat.* p. 30; *Bouleng. Cat. Chel. &c.* p. 251.
Trionyx jeudi, *Gray, P. Z. S.* 1869, p. 217, figs.
Trionyx cariniferus (*non Gray*), *Theob. P. A. S. B.* 1874, p. 80, pl. iv.

Costal plates eight pairs, the last well developed, with slightly concave posterior border, and in contact on the median line; a single neural between the first pair of costals; plates rather coarsely pitted and vermiculate. Epiplastra in contact in front of the entoplastron, which forms an obtuse or right angle; plastral callosities hardly developed, the hyoplastra bearing a mere trace of sculpture. Head moderate; skull as in *T. formosus*, but snout a little longer in the adult. Head of adult spotted or vermiculated with black above and uniform whitish inferiorly, as in *T. formosus.*

Length of dorsal disk 20 inches.

Hab. Pegu, Arrakan range, Tenasserim and Sumatra.

10. Trionyx cartilagineus.

Testudo cartilaginea, *Boddaert, Epistola ad W. Roëll*, 1770.
Trionyx ornatus, *Gray, P. Z. S.* 1861, p. 41, pl. v; *Günth. Rept. B. I.* p. 48, pl. vi, fig. B.
Trionyx stellatus, var. javanicus *(Geoffr.), Theob. P. A. S. B.* 1874, p. 79, pl. iii; *id. Cat.* p. 30.
Trionyx ephippium, *Theob. P. A. S. B.* 1875, p. 177, pl. v.
Trionyx cartilagineus, *Bouleng. Cat. Chel. &c.* p. 253.

Costal plates eight pairs, the last well developed and forming a median suture behind the last neural; a single neural between the first pair of costals; dorsal plates coarsely pitted and vermiculate. Dorsal skin of young with longitudinal ridges of small tubercles. Epiplastra in contact, or narrowly separated, in front of the entoplastron, which forms an obtuse or a right angle; plastral callosities well developed in the adult, hyo-hypoplastral and xiphiplastral, and coarsely sculptured like the carapace. Head moderate; snout (on the skull) considerably longer than the diameter of the orbit; interorbital region, in the adult, as broad as the nasal fossa, or a little narrower; postorbital arch very narrow, one third or one fourth the diameter of the orbit; mandible with a strong ridge along the symphysis, the diameter of which equals or exceeds the diameter of the orbit. Olive-brown above and on the chin; head and chin with numerous yellow spots, the largest of which are below the temple; dorsal disk of young light-dotted, and usually with a few large blackish spots; lower parts white.

Size of *T. hurum.*

Hab. Pegu, Tenasserim, Siam, Camboja, Malay Peninsula, Sumatra, Borneo, Java.

Genus PELOCHELYS,

Gray, P. Z. S. 1864, p. 89.

Outer extremities of the nuchal plate overlying the second dorsal rib; neural plates well developed. Limbs completely exposed. Hyoplastron distinct from hypoplastron; not more than five plastral callosities. Bony choanæ between the orbits; jaws weak; postorbital arch as broad as the diameter of the orbit; posterior border of pterygoids free, without ascending process.

A single species.

11. Pelochelys cantoris.

Chitra indica, part., *Gray, Cat. Tort.* p. 49; *Günth. Rept. B. I.* p. 50, pl. vi. fig. C.
Gymnopus indicus, *Cantor, J. A. S. B.* xvi, 1847, p. 616.
Pelochelys cantorii, *Gray, P. Z. S.* 1864, p. 90, figs.; *Theob. Cat.* p. 28; *Bouleng. Cat. Chel. &c.* p. 265.

Costal plates eight pairs, the last well developed and forming a median suture; a single neural between the first pair of costals; plates coarsely pitted and vermiculate. Dorsal skin of young

tuberculate. Epiplastra small and widely separated; entoplastron forming a right or an acute angle; plastral callosities largely developed. Head moderate; snout very short and broad; proboscis very short; interorbital space broader than the greatest diameter of the orbit; mandible narrowest at the symphysis. Olive above, uniform or spotted with darker; lips and throat of young olive, speckled with whitish; plastron whitish.

Length of dorsal disk 2 feet.

Hab. Ganges, Burma, Malay Peninsula, Borneo, Philippines.

Genus **CHITRA**,

Gray, Cat. Tort. p. 49, 1844.

Outer extremities of the nuchal plate overlying the second dorsal rib; neural plates well developed. Limbs completely exposed. Hyoplastron distinct from hypoplastron; not more than five plastral callosities. Bony choanæ behind the orbits, which are situated quite at the anterior extremity of the skull; jaws weak; postorbital arch at least twice as broad as the diameter of the orbit; posterior border of pterygoids free, without ascending process.

A single species.

12. **Chitra indica.**

Trionyx indicus, *Gray, Syn. Rept.* p. 47.
Trionyx ægyptianus, var. indicus, *Gray, Ill. Ind. Zool.* i, pl. lxxx.
Chitra indica, part., *Günth. Rept. B. I.* p. 50.
Chitra indica, *Gray, P. Z. S.* 1864, p. 91, figs.; *Theob. Cat.* p. 27; *Bouleng. Cat. Chel. &c.* p. 264.

Costal plates eight pairs, the last well developed and forming a median suture; a single neural between the first pair of costals; plates coarsely pitted and vermiculate. Epiplastra widely separated; entoplastron forming an acute angle; plastral callosities largely developed. Head small, with extremely short snout; interorbital space considerably narrower than the greatest diameter of the orbit. Olive or green above, whitish inferiorly; dorsal disk of young with dark vermiculations; head and neck with dark longitudinal lines.

Length of dorsal disk 2 feet.

Hab. Ganges and Irrawaddy; Indus?

Genus **EMYDA**,

Gray, Syn. Rept. p. 49, 1831.

Nuchal notched at each outer end, which underlies the first costal plate; carapace large, with a series of bony plates in the posterior cutaneous border and a prænuchal marginal bony plate; neural plates well developed, seven or eight in number, forming a

continuous series; eighth pair of costals large in the adult, and, like the penultimate, forming a median suture. Plastron with a cutaneous femoral valve, under which the hind limb may be concealed; hyoplastron coossified with hypoplastron; seven plastral callosities (in the adult). Bony choanæ between the orbits; jaws strong; postorbital arch moderate, much narrower than the diameter of the orbit; posterior border of pterygoids with a median ascending process forming a suture with the opisthotic.

Three species are distinguished, all being Indian or Burmese.

Synopsis of the Species.

Head with yellow spots; entoplastral callosity small. *E. granosa*, p. 17.
Head without yellow spots; first marginal plate much larger than second.......................... *E. vittata*, p. 17.
Head without yellow spots; first marginal plate not larger than second.......................... *E. scutata*, p. 18.

13. Emyda granosa.

Testudo granosa, *Schoepff, Test.* p. 127, pl. XXX, A & B.
Trionyx granosa *and* T. punctata, *Gray, Ill. Ind. Zool.* ii, pls. lxiii, lxiv.
Emyda granosa, *Günth. Rept. B. I.* p. 45; *Theob. Cat.* p. 32; *Bouleng. Cat. Chel. &c.* p. 269.
Emyda dura, *Anders. Journ. Linn. Soc.* xii, 1876, p. 514.

Carapace and plastral callosities finely and uniformly granulate; two neural plates between the first pair of costals; anterior marginal very large, much larger than the others; seven plastral callosities, of which the entoplastral is much the smallest; the extent of these callosities varies considerably, not only with age, but according to individuals. Head moderate; snout short. Skin of dorsal disk, in the young, longitudinally plaited. Olive-brown above, with round yellow spots on the head and back, which become less distinct in adult specimens; plastron and margin of carapace yellowish white.

Length of dorsal disk 10 inches.

Hab. Indus and Ganges plains, in rivers, canals, &c.

14. Emyda vittata.

Emyda punctata (*non Gray*), *Kelaart, Prodr.* p. 179.
Emyda vittata, *Peters, MB. Ak. Berl.* 1854, p. 216; *Günth. Rept. B. I.* p. 46; *Theob. Cat.* p. 32; *Bouleng. Cat. Chel. &c.* p. 269.
Emyda ceylonensis, *Gray, Cat. Sh. Rept.* i, p. 64, pl. xxix A; *Günth. Rept. B. I.* p. 45.

Under this name may be provisionally grouped such specimens as agree with *E. granosa* except in the uniform brown colour of the upper parts (with or without darker bands on the head and neck), and usually in the larger entoplastral and xiphiplastral callosities. The constancy of these characters and the correlation

between them, however, still require to be tested upon a larger number of specimens.

Hab. Ceylon; Southern India; Godávari, Mahánadi, and their tributaries.

15. Emyda scutata.

Emyda scutata, *Peters, MB. Ak. Berl.* 1868, p. 449; *Theob. Cat.* p. 32; *Bouleng. Cat. Chel. &c.* p. 270.
Emyda fuscomaculata, *Gray, A. M. N. H.* (4) xi, 1873, p. 308.

Very closely allied to *E. granosa* and *E. vittata*, but anterior marginals less enlarged, less unequal in size, the first not larger than the second. Entoplastral callosity large or moderate. Brown above, carapace spotted or reticulated with darker.

Hab. Irrawaddy.

Superfam. B. CRYPTODIRA.

Neck bending by a sigmoid curve in a vertical plane; cervical vertebræ without transverse processes or with mere indications of them; centrum of the last cervical articulating with the centrum of the first dorsal. Mandible with articulary concavities; outer border of tympanic cavity incompletely bony; pterygoids narrow in the middle, in contact on the median line. Pelvis not anchylosed to the carapace and plastron. Digits with not more than three phalanges. Epiplastra in contact with hyoplastra; entoplastron, if present, oval, rhomboidal, or T-shaped. A complete series of marginal bones, connected with the ribs.

Family II. TESTUDINIDÆ.

Shell covered with epidermal shields. Caudal vertebræ procœlous. Neck completely retractile within the shell. Parietal bones widely separated from squamosals. Digits short or moderately elongate; phalanges with condyles; claws four or five.

This family, which contains the bulk of recent Chelonians, is distributed over every part of the world except Australia. Ten genera are represented in the Indian Region.

Synopsis of Indian Genera.

A. Limbs club-shaped; alveolar surface of upper jaw with a median ridge .... TESTUDO, p. 19.
B. Digits distinct, with at least a rudiment of web; alveolar surface of upper jaw without median ridge.
  a. Head covered with undivided skin.
    a′. Plastron not hinged; no bony temporal arch. GEOEMYDA, p. 23.
    b′. Plastron not hinged; a bony temporal arch. NICORIA, p. 26.
    c′. Plastron hinged, movable; a bony temporal arch .... CYCLEMYS, p. 28.

b. Hinder part of head covered with small shields.
a'. Choanæ between the eyes .... BELLIA, p. 32.
b'. Choanæ behind the level of the eyes .... DAMONIA, p. 34.
C. Digits distinct, extensively or entirely webbed; alveolar surface of upper jaw with one or two median ridges.
a. Fourth vertebral shield not longer than third, embracing three neural bones.
a'. Axillary and inguinal buttresses of plastron short; choanæ behind the level of the eyes .... MORENIA, p. 35.
b'. Axillary and inguinal buttresses much developed, the former connected with the first rib or nearly reaching it.
a''. Choanæ behind the level of the eyes; alveolar surface of upper jaw with a single median ridge .... HARDELLA, p. 36.
b''. Choanæ behind the level of the eyes; alveolar surface of upper jaw with two median ridges; fore limb with four claws only .... BATAGUR, p. 37.
b. Fourth vertebral shield elongate, embracing four or five neural bones .... KACHUGA, p. 38.

Genus TESTUDO,

Linn. Syst. Nat. i, p. 350 (part.), 1766.

Neural plates usually alternately tetragonal and octagonal; costal plates alternately narrower and wider. Suture between the marginal and costal bones and shields usually corresponding; supracaudal shield usually single. Plastron extensively united to the carapace by suture, with short axillary and inguinal buttresses, which do not reach, or just reach, the costal plates; entoplastron usually anterior to the humero-pectoral suture. Skull with weak or moderately wide postorbital and temporal arches; alveolar surface of upper jaw with one or two median ridges; choanæ between the eyes. Head shielded above. Limbs club-shaped, covered with large scales or tubercles. Tail short.

This genus, of which some 40 species are known, is represented in every part of the world except Australia. Habits terrestrial and herbivorous.

Synopsis of Indian Species.

A. Supracaudal shield single.
a. Nuchal shield present; forehead with large shields.
a'. Anal shields forming a very short suture, or entirely separated by the anal notch. . *T. elongata*, p. 20.
b'. Suture between the anals at least as long as that between the abdominals .... *T. leithii*, p. 20.

b. No nuchal; forehead with small irregular shields.
  a'. Heel and hinder side of thighs with spur-like tubercles; plastron with dark radiating lines .... *T. elegans*, p. 21.
  b'. Heel and hinder side of thighs without spur-like tubercles; plastron without radiating lines........................ *T. platynota*, p. 22.
B. Supracaudal shields two .... *T. emys*, p. 22.

16. Testudo elongata.

Testudo elongata, *Blyth, J. A. S. B.* xxii, 1853, p. 639; *Günth. Rept. B. I.* p. 8; *Theob. Cat.* p. 3; *Bouleng. Cat. Chel. &c.* p. 173.

Shell considerably depressed, more than twice as long as deep, with flat vertebral region; anterior and posterior margins slightly reverted, strongly serrated in young, feebly in old specimens; shields concentrically striated, except in old specimens; nuchal present (rarely absent), narrow and elongate; supracaudal undivided, more or less incurved; first vertebral usually nearly as long as broad in the adult, the others broader than long and nearly as broad as the costals. Plastron large, truncate anteriorly, deeply notched posteriorly; suture between the pectoral shields as long as or longer than that between the humerals; suture between the gulars as long as or a little shorter than that between the pectorals; anals forming a very short suture, or entirely separated by the anal notch; axillary and inguinal moderate. Head moderate; a pair of large præfrontal shields, usually followed by a nearly equally large frontal; beak feebly hooked, tricuspid; alveolar ridge of upper jaw short and rather feeble. Anterior face of fore limbs with moderate, unequal-sized, imbricate scales, which are largest towards the outer side; no enlarged tubercles on the thighs; tail ending in a claw-like horny tubercle. Carapace and plastron greenish yellow, each shield with an irregular black spot or blotch, which may occupy its greater portion, or may be much broken up or indistinct.

Length of shell $10\frac{1}{2}$ inches.

Hab. Bengal (Chaibassa), Assam, the whole of Burma, Camboja, Cochin China.

17. Testudo leithii.

Testudo leithii, *Günth. P. Z. S.* 1869, p. 502, figs.; *Theob. Cat.* p. 3; *Bouleng. Cat. Chel. &c.* p. 175.

Shell very convex, not twice as long as deep, deeply notched anteriorly; nuchal shield triangular; posterior border of supracaudal forming an angle, projecting beyond the marginals; second vertebral shield longest; shields concentrically striated. Plastron large, hind lobe notched behind and movable in the adult; suture between the pectoral shields a little shorter than that between the humerals; suture between the anals longer than that between the

femorals; axillary and inguinal moderate. Head moderate; a pair of large præfrontal shields, followed by a very large frontal; beak scarcely hooked; alveolar ridge of upper jaw short and feeble. Anterior face of fore limb covered with a few extremely large imbricate bony scutes disposed in three longitudinal and five transverse series. Carapace yellow, each shield bordered anteriorly and laterally with blackish brown; plastron yellow, each abdominal shield with a dark brown triangular or cuneiform marking.

Length of shell 5 inches.

Hab. Lower Egypt and the neighbouring part of Syria. The single specimen upon which the species was founded was said to be from Sind, where, however, this tortoise does not appear to have been rediscovered during the last twenty years.

18. Testudo elegans.

Testudo elegans, *Schoepff, Test.* p. 111, pl. xxv; *Günth. Rept. B. I.* p. 4; *Theob. Cat.* p. 2; *Bouleng. Cat. Chel. &c.* p. 161.
Testudo megalopus, *Blyth, J. A. S. B.* xxii, 1853, p. 640.

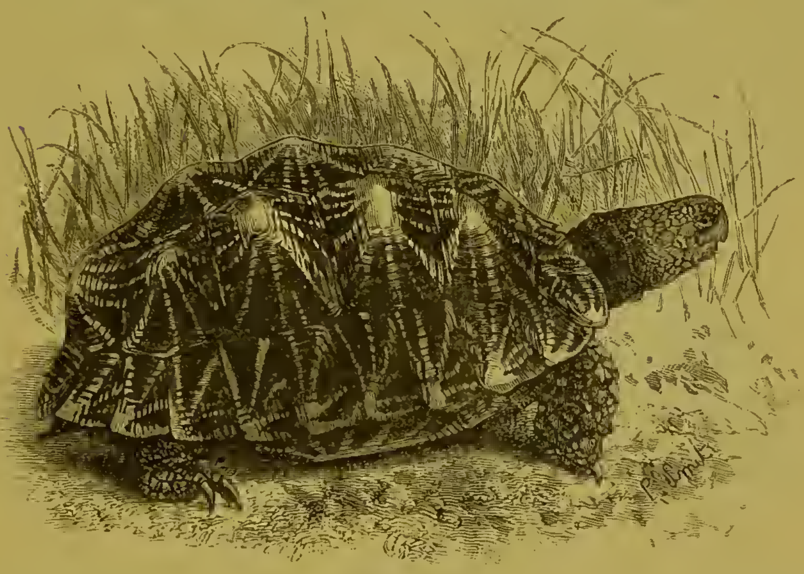


Fig. 6.—*Testudo elegans.*

Carapace very convex, dorsal shields often forming humps; lateral margins nearly vertical; posterior margin somewhat expanded and strongly serrated; no nuchal; supracaudal undivided, incurved in the male; shields strongly striated concentrically; first vertebral longer than broad, the others broader than long, third at least as broad as the corresponding costal. Plastron large, truncated or openly notched in front, deeply notched, bifid behind; suture between the humerals much longer than that between the femorals; suture between the pectorals very short; axillary and inguinal rather small. Head moderate; forehead swollen, convex, and covered with rather small and irregular shields; beak feebly hooked, bi- or

tricuspid; edge of jaws denticulated; alveolar ridge of upper jaw strong. Outer-anterior face of fore limb with numerous unequal-sized, largo, imbricate, bony, pointed tubercles; heel with large, more or less spur-like tubercles; a group of large conical or subconical tubercles on the hinder side of the thigh. Carapace black, with yellow areolæ from which yellow streaks radiate; these streaks usually narrow and very numerous; plastron likewise with black and yellow radiating streaks.

Length of shell 10 inches.

Hab. India (except Lower Bengal), extending west to Sind; and Ceylon.

19. Testudo platynota.

Testudo platynota, *Blyth, J. A. S. B.* xxxii, 1863, p. 83; *Theob. Cat.* p. 2; *Bouleng. Cat. Chel. &c.* p. 162.

Very closely allied to the preceding, but carapace more regularly oval; posterior border not or but very slightly expanded, and more feebly serrated; vertebral shields flat. Yellow rays on the dorsal shields wider and fewer, usually three to the right and three to the left of each shield; plastron yellow, with some large black blotches but without radiating streaks. According to Anderson, the scales on the fore limb are fewer and all rounded, the sharp scales on the heel are absent, and the conical scales on the posterior portion of the thigh are very much smaller and not at all prominent.

Hab. Upper Burma and Northern Pegu.

20. Testudo emys.

Testudo emys, *Schleg. & Müll. in Temminck, Ver. Nat. Nederl. Ind., Rept.* p. 34, pl. iv; *Bouleng. Cat. Chel. &c.* p. 158.
Geoemyda spinosa, part., *Cantor, J. A. S. B.* xvi, 1847, p. 607.
Manouria fusca, *Gray, P. Z. S.* 1852, p. 134.
Testudo phayrei, *Blyth, J. A. S. B.* xxii, 1853, p. 639.
Manouria emys, *Günth. Rept. B. I.* p. 10; *Theob. Cat.* p. 4.
Testudo (Scapia) falconeri, *Gray, P. Z. S.* 1869, p. 169, figs.

Shell considerably depressed, its depth not half its length; anterior and posterior margins reverted, more or less strongly serrated; nuchal present; supracaudal shields two; dorsal shields concentrically striated, often concave; vertebrals much broader than long and at least as broad as costals. Plastron large, gular region somewhat produced and usually notched, hind lobe deeply notched; the pectoral shields may be widely separated from each other, or from a short median suture; axillary shield very small, inguinal large. Head moderate; two large præfrontal shields and a large frontal; beak not hooked; jaws feebly denticulated, the alveolar surface of the upper jaw with a strong median ridge. Fore limb anteriorly with very large, bony, pointed, imbricate tubercles, forming four or five longitudinal series; hind limb with very large bony tubercles on the plantar surface, with others larger, conical, and spur-like on

the heel, and a group of still larger conical tubercles on each side on the back of the thighs. Adult dark brown or blackish; carapace of young yellowish brown, with dark-brown markings.

Length of shell 18 inches.

Hab. Assam, Burma, Siam, Malay Peninsula, Sumatra.

Genus **GEOEMYDA**,

Gray, P. Z. S. 1834, p. 100 (part.).

Neural plates mostly hexagonal, hinder lateral margins shortest. Plastron extensively united to the carapace by suture, with axillary

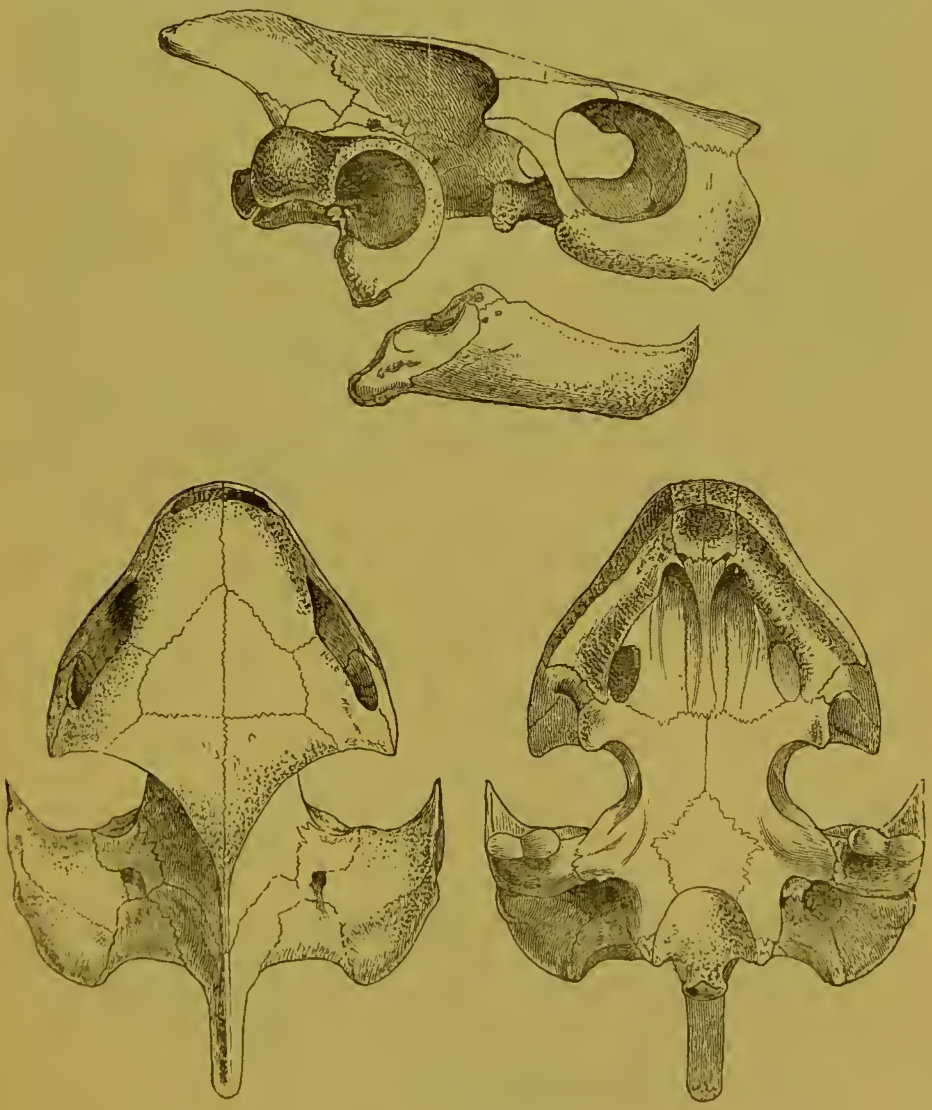


Fig. 7.—Skull of *Geoemyda grandis*.

and inguinal peduncles just reaching the first and fifth costals; entoplastron intersected by the humero-pectoral suture. Skull

without bony temporal arch; alveolar surfaces narrow, without median ridge. Upper surface of head covered with undivided skin. Digits with a short web. Tail very short, not longer in the young than in the adult.

Distribution. Burma, Malay Peninsula and Archipelago.

Three species are known. Habits terrestrial or semiaquatic.

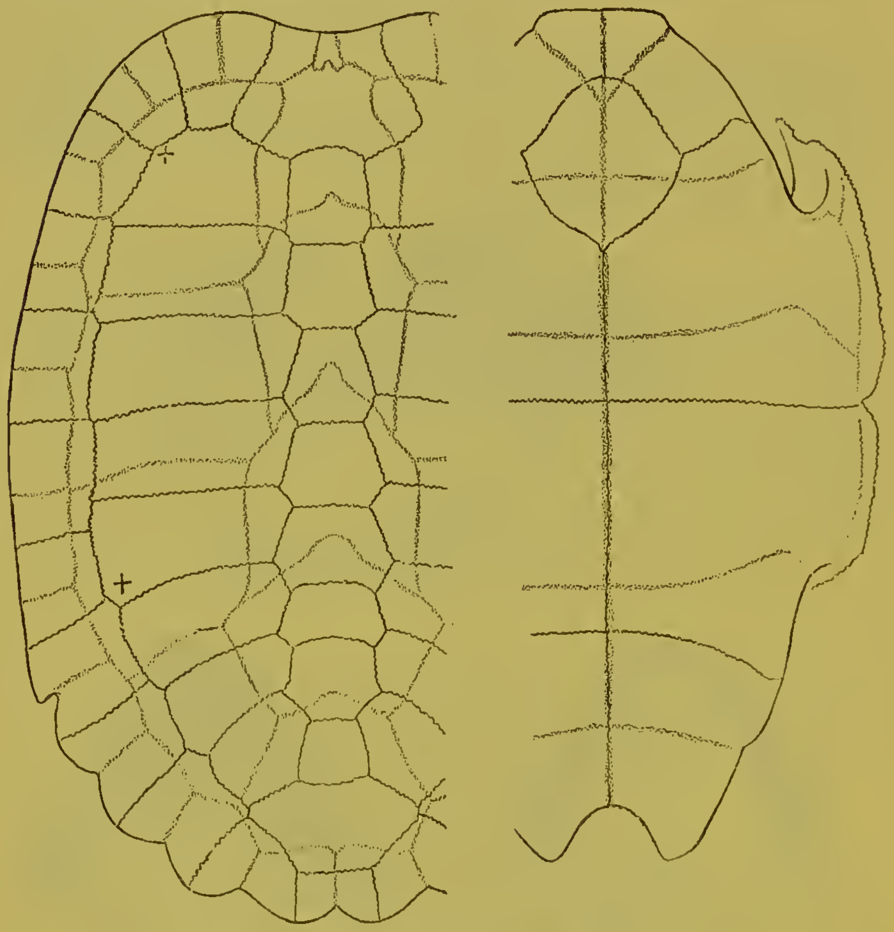


Fig. 8.—Shell of *Geoemyda grandis.*

Synopsis of the Species.

A. Anterior margin of shell serrated; second vertebral shield at least as broad as the second costal, much broader than long .... *G. spinosa*, p. 25.

B. Anterior margin of shell not serrated; second vertebral shield narrower than the second costal, not much broader than long.

a. Carapace arched or tectiform in a transverse section .... *G. grandis*, p. 25.

b. Carapace much depressed, flat on the vertebral region .... *G. depressa*, p. 25.

21. Geoemyda spinosa.

Emys spinosa, *Gray, Syn. Rept.* p. 20; *id. Ill. Ind. Zool.* i, pl. lxxvii, figs. 1, 2.
Geoemyda spinosa, *Gray, P. Z. S.* 1834, p. 100; *id. Ill. Ind. Zool.* ii, pl. lvii, fig. 2; *Günth. Rept. B. I.* p. 18; *Theob. Cat.* p. 5; *Bouleng. Cat. Chel. &c.* p. 137.

Carapace of adult much depressed, with broad flat vertebral region and an uninterrupted obtuse keel; anterior and posterior margins serrated; carapace of young more regularly arched, with a short keel or spinose tubercle on each costal shield, and the border strongly serrated all round, each marginal being produced in a spine, with or without smaller denticulation on each side; the vertebral keel stronger than in the adult. Vertebral shields (2–4) much broader than long, at least as broad as the costals; nuchal shield longer than broad. Plastron large; the width of the bridge about equals the length of the posterior lobe, which is angularly emarginate; as regards size, the plastral shields take the following order commencing with the largest:—abdominals, pectorals, femorals, humerals, anals, gulars; the suture between the abdominals not or but slightly longer than that between the pectorals; axillary and inguinal shields present. Upper jaw bicuspid. Carapace brown above, reddish in the young, the vertebral keel lighter; each plastral shield with yellow and dark-brown radiating streaks; soft parts dark brown, with a yellowish spot on each side of the neck, near the ear.

Length of carapace 8 inches.

Hab. Tenasserim, Malay Peninsula, Sumatra, Borneo.

22. Geoemyda grandis.

Geoemyda grandis, *Gray, A. M. N. H.* (3) vi. 1860, p. 218; *Günth. Rept. B. I.* p. 19, pls. i & ii, figs. A & B; *Theob. Cat.* p. 5; *Bouleng. Cat. Chel. &c.* p. 138.

Carapace arched or tectiform, not flattened on the vertebral region, which bears a strong but obtuse keel; only the posterior margin serrated. Vertebral shields (1–3) not or but slightly broader than long and narrower than the costals; nuchal longer than broad. Plastron similar to that of *G. spinosa*; the length of the suture between the pectoral shields at least two thirds that of the abdominals. Dark brown or blackish above; plastron and lower surface of marginals with black and yellow rays, either the black or the yellow predominating.

Length of carapace 16 inches.

Hab. Pegu, Tenasserim, Siam.

23. Geoemyda depressa.

Geoemyda depressa, *Anders. A. M. N. H.* (4) xvi, 1875, p. 284; *id. An. Zool. Res. Yunnan*, p. 721, pls. lv, lvi, & lxxv B, figs. 1–5; *Bouleng. Cat. Chel. &c.* p. 139.
Geoemyda arakana, *Theob. Cat.* p. vii.

Shell much depressed, the depression increasing from before backwards, the shell being somewhat expanded across the inguinal region; only the posterior border serrated; second vertebral about as long as broad, narrower than the costals; nuchal longer than broad. Plastral shields as in *G. spinosa* and *G. grandis.* Carapace light brown; plastron and lower surface of marginals yellow, the plastral shields with a few broad black rays; the interval between the axillary and inguinal notches black. Head leaden, neck pale yellowish brown; limbs of the latter colour, with the large scales dark, almost black.

Length of carapace $9\frac{1}{2}$ inches.

Hab. Hills near Akyab, Arrakan.

Genus **NICORIA**,

Gray, Cat. Sh. Rept. i, p. 17 (1855).

Neural plates mostly hexagonal, with the hinder lateral margins

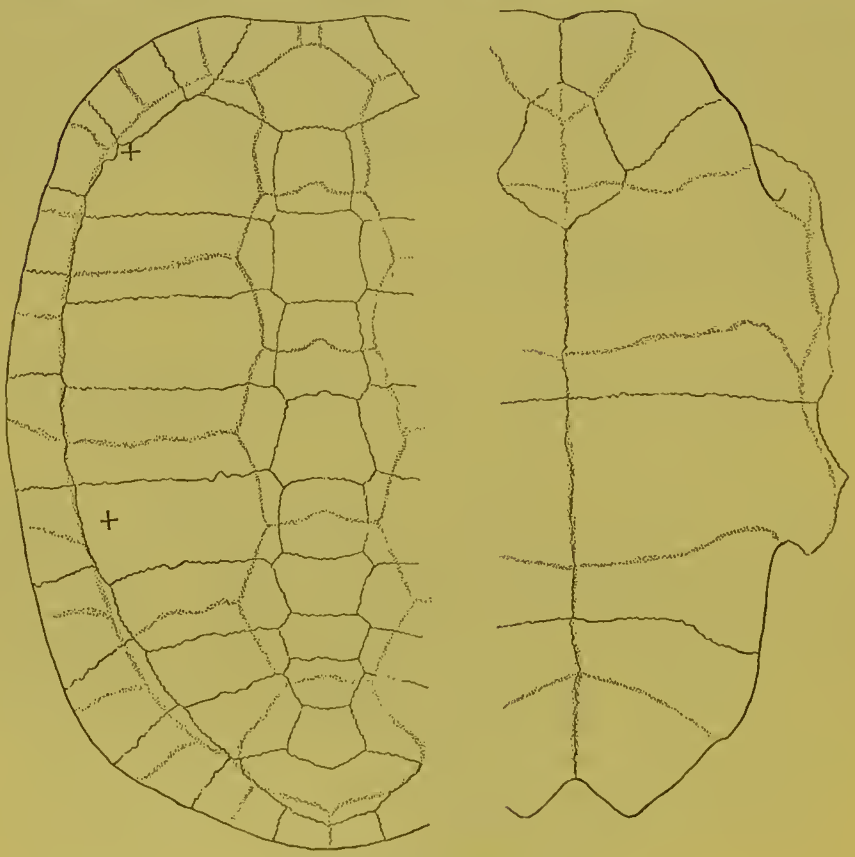


Fig. 9.—Shell of *Nicoria trijuga.*

shortest, or alternately tetragonal and octagonal. Plastron more or less extensively united to the carapace by suture, with short axillary

buttress, just reaching the first costal plate; entoplastron intersected by the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces without median ridge; choanæ between the eyes. Upper surface of head covered with undivided skin. Digits with a short web or nearly free. Tail short, not longer in the young than in the adult.

Distribution. Oriental Region, Central and South America.

Two species occur within the limits of the present fauna. Habits terrestrial or semiaquatic.

Synopsis of Indian Species.

Digits webbed; plastron brown or black .... *N. trijuga*, p. 27.
Digits nearly free; plastron yellow .... *N. tricarinata*, p. 28.

24. Nicoria trijuga.

Emys trijuga, *Schweigg. Prodr.* p. 41 (370); *Günth. Rept. B. I.* p. 29.
Melanochelys trijuga, *Gray, P. Z. S.* 1869, p. 187; *Theob. Cat.* p. 12.
Emys trijuga, var. maderaspatana, *Anders. An. Zool. Res. Yunnan,* p. 729.
Nicoria trijuga, *Bouleng. Cat. Chelon. &c.* p. 121.

Carapace moderately depressed, tricarinate. Vertebral shields in adult as long as broad or longer than broad, and much narrower than the costals; nuchal moderate or small, sometimes absent. Plastron large; the width of the bridge equals or a little exceeds the length of the posterior lobe, which is broadly notched; front lobe truncated. Axillary and inguinal shields present. Upper jaw not hooked, notched mesially; the width of the mandible at the symphysis is less than the diameter of the orbit. Digits distinctly webbed. Tail shorter than the head. Shell brown, with a yellow stripe on each side of the plastron; keels sometimes yellowish. Head brown, in the young reticulated with yellowish (in spirit), and with a yellowish line from the eye to above the tympanum.

Length of shell 9 inches.

Hab. Peninsula of India and Punjab.

Var. **thermalis.**

Emys thermalis, *Lesson, Cent. Zool.* p. 86, pl. xxix.
Geoclemmys seba, *Gray, Cat. Sh. Rept.* i, p. 18.
Emys trijuga, *Kelaart, Prodr.* p. 177; *Günth. Rept. B. I.* pl. ii, fig. C.
Melanochelys sebæ, *Theob. Cat.* p. 12.
Emys sebæ, *Anders. An. Zool. Res.* p. 729.

Shell dark brown in the young, with a broad yellow border to the plastron; keels often yellowish; shell of adult deep black, with a narrow yellow border to the plastron. Soft parts blackish; head of young and halfgrown with irregular bright-orange spots, which disappear in the adult.

Length of shell 9 inches.

Hab. Ceylon.

Var. **edeniana**.

Melanochelys edeniana, *Theob. Cat.* p. 12.
Emys trijuga, var. burmana, *Anders. An. Zool. Res.* p. 729, pls. lvii & lviii.

A larger race, with the shell deep black, the plastral border, and sometimes also the keels, yellowish. Light markings on the head, if present, small.

Length of shell 16 inches.

Hab. Burma.

25. Nicoria tricarinata.

Geoemyda tricarinata, *Blyth, J. A. S. B.* xxiv, 1855, p. 714.
Chaibassia tricarinata, *Theob. Cat.* p. 6.
Chaibassia tricarinata *and* theobaldi, *Anders. An. Zool. Res. Yunnan*, pp. 717, 718; *Bouleng. Cat. Chel. &c.* pp. 139, 140.
Nicoria tricarinata, *Lydekker, J. A. S. B.* lviii, 1889, p. 327, fig.

Allied to the preceding species, but of more terrestrial habits, as indicated by the more convex carapace, abruptly descending posteriorly, and the very indistinct web between the digits. Scales on the limbs larger. The hypoplastron is frequently attached to the carapace by ligament; no inguinal shield. Carapace dark brown or black, with the three keels yellow; plastron uniform yellow; head black, with a broad yellow or reddish band on each side passing over the eye and the tympanum; a narrow similar band below the angle of the mouth, along the inferior margin of the lower jaw; neck and limbs blackish.

Length of shell 5 inches.

Hab. Bengal (Chaibassa) and Assam (Bisthnath Plain).

I have recently had an opportunity of examining specimens of *C. tricarinata* and *theobaldi*, and regard them as belonging to one species, which cannot be generically separated from *N. trijuga*.

Genus CYCLEMYS,

Bell, P. Z. S. 1834, p. 17.

Neural plates mostly hexagonal, posterior lateral margins shortest. Plastron united to carapace by ligament, and more or less distinctly divided into two lobes moving upon a ligamentous hinge between the hyo- and the hypoplastra; both the latter bones contributing to the formation of the bridge; entoplastron intersected by the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces without median ridge; choanæ between the eyes. Upper surface of head covered with undivided skin. Digits webbed or nearly free. Tail short, not longer in the young than in the adult.

Distribution. The greater part of the Oriental Region, east of the Bay of Bengal. Terrestrial or semiaquatic.

The ligamentous transverse hinge, dividing the plastron into an anterior and a posterior moiety, may be indistinct, and is nearly always so in quite young specimens. These may, however, be readily distinguished from young of the preceding genus by the hooked upper jaw.

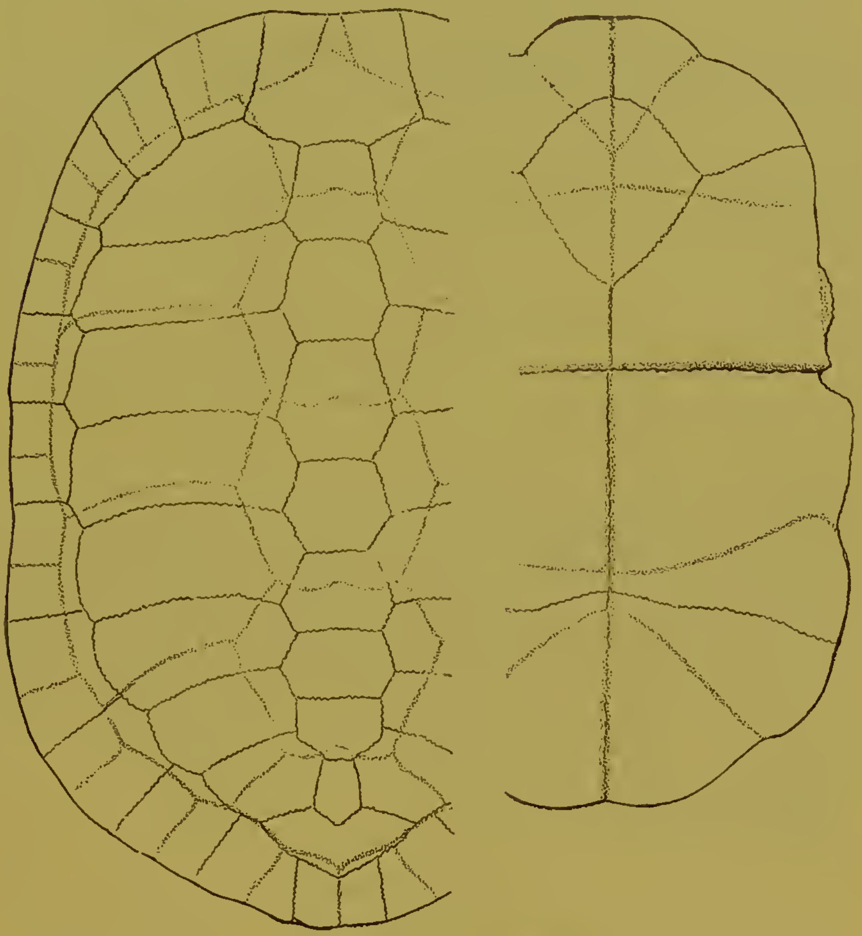


Fig. 10.—Shell of *Cyclemys amboinensis*.

Synopsis of Burmese Species.

A. Plastron emarginate posteriorly; posterior margin of carapace serrated.	
a. Suture between pectoral shield and marginals longer than that between abdominal and marginals	*C. platynota*, p. 30.
b. Suture between pectoral and marginals shorter than that between abdominal and marginals.	
a′. Carapace unicarinate.................	*C. dhor*, p. 30.
b′. Carapace tricarinate	*C. mouhoti*, p. 31.
B. Plastron not notched posteriorly; carapace tricarinate in the young; posterior margin not serrated	*C. amboinensis*, p. 31.

26. Cyclemys platynota.

Emys platynota, *Gray, P. Z. S.* 1834, p. 54; *id. Ill. Ind. Zool.* ii, pl. lvii, fig. 1.
Cyclemys platynota, *Gray, Cat. Sh. Rept.* i, p. 43; *Bouleng. Cat. Chel. &c.* p. 130.
Notochelys platynota, *Günth. Rept. B. I.* p. 17; *Theob. Cat.* p. 10.

Carapace depressed, angular, the vertebral region flat, with an interrupted obtuse keel; posterior margin serrated; six, rarely seven, vertebral shields, the small additional shield intercalated between the fourth and fifth; vertebrals (except the first) much broader than long, at least as broad as the costals. Plastron narrower than the opening of the shell, hind lobe openly emarginate, connected with the carapace by a distinct bridge, the width of which is contained twice and a half to twice and two thirds in the length of the plastron; the hyo- and hypoplastral bones contribute to an equal degree to the formation of the bridge; no distinct transverse hinge; a large inguinal shield; the suture between the pectoral shield and the marginals longer than that between the abdominal and the marginals; the median suture between the pectoral shields as long as or a little longer than that between the abdominals. Hook of the upper jaw bicuspid, divided by a median groove. Digits extensively webbed; claws long, curved, sharp. Front part of arm with broad, band-like transverse shields. Carapace reddish brown, or yellowish brown with radiating brown lines; young with a pair of round black spots on each vertebral shield, and one or two similar spots on each costal; plastron yellow with brown spots, or brown with the sutures between the shields yellow. Head yellowish brown; neck brown, with irregular yellowish streaks, the broadest of which extends from the posterior corner of the eye.

Length of shell $9\frac{1}{2}$ inches.

Hab. Mergui, Malay Peninsula, Sumatra, Borneo.

27. Cyclemys dhor.

Emys dhor, part., *Gray, Syn. Rept.* p. 20.
Emys dentata, *Gray, Ill. Ind. Zool.* ii, pl. lviii, fig. 2.
Cyclemys oldhamii, *Gray, P. Z. S.* 1863, p. 178; *Günth. Rept. B. I.* p. 15, pl. v, fig. B.
Cyclemys dentata, *Theob. Cat.* p. 8.
Cyclemys dhor, *Bouleng. Cat. Chel. &c.* p. 131.

Carapace depressed, with a single, obtuse keel; posterior margin serrated; vertebral shields as broad as long or broader than long, narrower than the costals. Plastron narrower than the opening of the shell, hind lobe angularly notched, connected with the carapace by a distinct bridge, the width of which is contained twice and three fourths to three times in the length of the plastron; the hyo- and hypoplastral bones contribute in a nearly equal degree to the formation of the bridge; the transverse hinge between the hyo- and hypoplastrals, which does not correspond with the curved suture between the pectoral and abdominal shields, is only deve-

loped in adult specimens; a small inguinal shield may be present; the suture between the pectoral shield and the marginals shorter than that between the abdominal and the marginals; the longest median suture is that between the pectorals. Hook of upper jaw bicuspid. Digits distinctly webbed, with sharp claws. Front part of arm with broad transverse scales. Carapace brown, or yellowish brown spotted with dark brown; plastron yellowish or pale brown in the young, with dark brown spots or radiating lines; in the adult, dark brown. Neck with dark and light longitudinal lines.

Length of shell 7½ inches.

Hab. Malay Archipelago and Peninsula, Camboja, Siam, Burma (Pegu, Tenasserim).

28. Cyclemys mouhoti.

Cyclemys mouhotii, *Gray, A. M. N. H.* (3) x, 1862, p. 157; *Bouleng. Cat. Chel. &c.* p. 132.

Pyxidea mouhotii, *Günth. Rept. B. I.* p. 16, pl. iv, fig. D; *Theob. Cat.* p. 9.

Carapace depressed, angular, the vertebral region flat, with three strong parallel keels; posterior margin serrated; vertebral shields much broader than long and as broad as the costals; first vertebral as long as broad or broader than long, narrower than second. Plastron a little narrower than the opening of the shell, hind lobe angularly emarginate; bridge broad and very short, its width about one third the length of the plastron; the hypoplastral bone and the abdominal shield have a much greater share in the formation of the bridge than the hyoplastral and pectoral; the longest median suture is that between the abdominals. Hook of the upper jaw strong, entire. Digits nearly free; limbs covered with large scales. Carapace yellowish or reddish brown; plastron yellowish, with or without a few large dark-brown spots; neck of young brown, spotted with yellow.

Length of shell 6½ inches.

Hab. Cachar, Siam, Cochin China.

29. Cyclemys amboinensis.

Testudo amboinensis, *Daud. Rept.* ii, p. 309.

Cistudo amboinensis, *Gray, Ill. Ind. Zool.* i, pl. lxxvii, figs. 3, 4.

Cuora amboinensis, *Gray, Cat. Sh. Rept.* i, p. 41; *Günth. Rept. B. I.* p. 12, pl. iv, figs. A, B; *Theob. Cat.* p. 7.

Cyclemys amboinensis, *Bouleng. Cat. Chel. &c.* p. 133.

Carapace depressed and tricarinate in the young, usually very convex and without or with a single keel in adult females; vertebral shields as long as broad or a little longer than broad in the adult, broader in the young, much narrower than the costals. Plastron as large as the opening of the shell in the adult, without distinct bridge; no anal notch; the line of junction between the

hyoplastron and the carapace shorter than that between the hypoplastron and the carapace; pectoral shields as long as the abdominals or shorter, as long as the humerals or slightly longer; axillary and inguinal small or absent. Head rather small; upper jaw scarcely hooked, without any emargination. Front part of arm with large transverse scales. Digits moderately webbed, with sharp claws. Carapace brown or blackish; plastron yellow with large black spots, or dark brown with the suture between the shields yellow; in the very young the black spots of the plastron are confluent into a broad longitudinal zone, the borders of the plastron being yellowish; head and neck brown above, yellow beneath; a yellow band borders the head and neck superiorly, meeting its fellow above the nostrils; a second yellow band passes through the eye and is separated from the upper jaw by a dark-brown band; ear yellow.

Length of shell 8 inches.

Hab. Pegu, Tenasserim, Siam, Malay Peninsula and Archipelago, eastward to the Moluccas.

Genus **BELLIA**,

Gray, P. Z. S. 1869, p. 197.

Neural plates hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with long axillary and inguinal buttresses, the latter anchylosed between the fifth and sixth costal plates; entoplastron intersected by the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces without median ridge; choanæ between the eyes. Skin of hinder part of head divided into small shields. Digits webbed. Tail very short, not longer in the young than in the adult.

Distribution. Burma, Siam, Malay Peninsula and Archipelago. Semiaquatic.

30. Bellia crassicollis.

Emys crassicollis, *Gray, Syn. Rept.* p. 21; *id. Ill. Ind. Zool.* i, pl. lxxvi, fig. 2; *Cantor, J. A. S. B.* xvi, 1847, p. 609; *Günth. Rept. B. I.* p. 28, pl. iv, fig. E.

Emys nigra, *Blyth, J. A. S. B.* xxiv, 1855, p. 713, *and* xxxii, 1863, p. 81.

Bellia crassicollis, *Gray, P. Z. S.* 1869, p. 197; *Bouleng. Cat. Chel. &c.* p. 98.

Bellia crassilabris, *Theob. Cat.* p. 10.

Carapace moderately depressed, tricarinate in the young, the keels, especially the laterals, becoming indistinct in old specimens; vertebral region flattened in the adult male; posterior border serrated; nuchal small, broadest behind; posterior side of first vertebral not half the length of the shield in the adult; vertebrals 2 to 4, as long as broad or a little broader than long, much narrower than the costals, narrowly in contact with each other in old

specimens; in the latter, the antero-lateral sides are convex, the postero-lateral longer and concave. Plastron smaller than the opening of the shell, truncate anteriorly, angularly notched posteriorly, feebly concave in the males, strongly angulated laterally

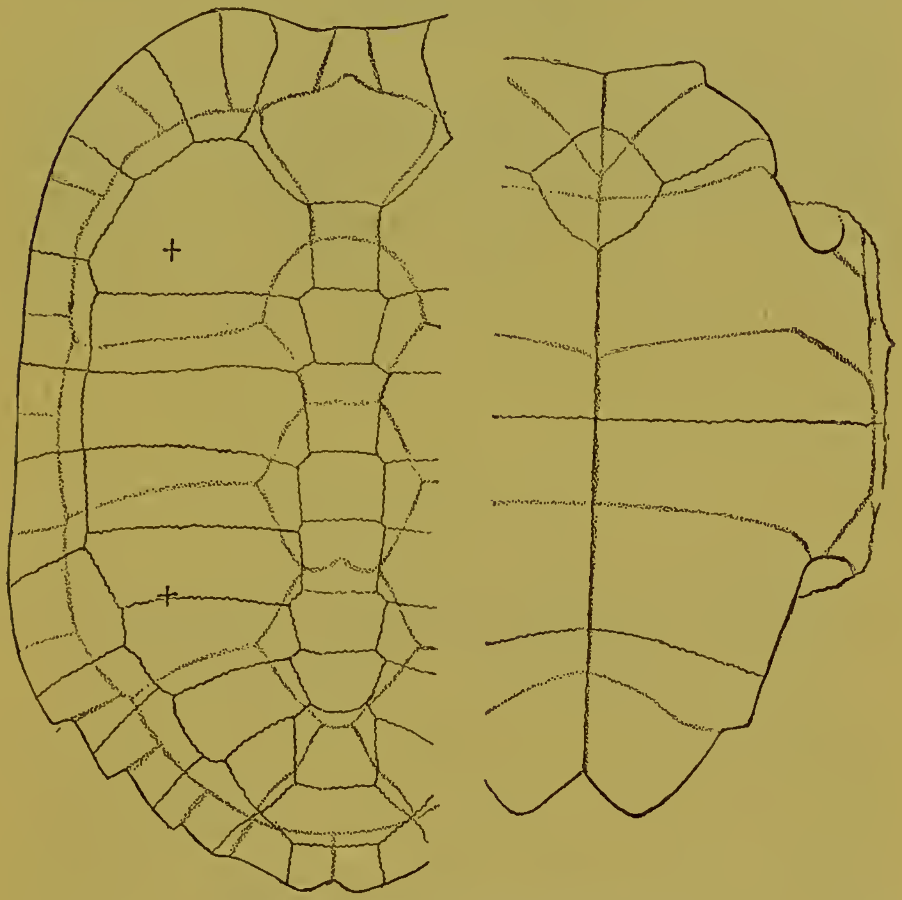


Fig. 11.—Shell of *Bellia crassicollis*.

in young specimens, feebly in old ones; the width of the bridge about equals the length of the hind lobe; relative size of plastral shields very variable; abdominals usually forming the longest median suture, humerals the shortest; axillary and inguinal shields present. Head rather large; snout very short, not prominent; upper jaw strongly curved on each side, not hooked; the width of the mandible at the symphysis is a little less than the diameter of the orbit. Digits webbed to the claws; front of forearm and outer side of leg with large transverse band-like scales. Shell dark brown or black, plastron usually with yellowish variegation, or bands following the sutures of the shields, or a broad band along each side. Soft parts dark brown or black; some large yellow spots on the head, viz. above the eye, above the ear, below the ear,

and on each side of the mandible; these spots become indistinct in old specimens.

Length of shell 7 inches.

Hab. Tenasserim, Siam, Malay Peninsula, Sumatra.

Genus DAMONIA,

Gray, P. Z. S. 1869, p. 193.

Neural plates hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with long axillary and inguinal peduncles; the latter anchylosed between the fifth and sixth, exceptionally fourth and fifth, costal plates; entoplastron intersected by the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces very broad, without median ridge; choanæ behind the level of the eyes. Skin of posterior part of head divided into small shields. Digits webbed. Tail short or moderate.

Distribution. East Indies, China, Japan. Semiaquatic.

A single species is found in India.

31. Damonia hamiltonii.

Emys hamiltonii, *Gray, Syn. Rept.* pp. 21, 72; *Günth. Rept. B. I.* p. 32.
Emys guttata (*non Schn.*), *Gray, Ill. Ind. Zool.* i, pl. lxxvi, fig. 1.
Damonia hamiltonii, *Gray, P. Z. S.* 1869, p. 195; *Theob. Cat.* p. 11; *Bouleng. Cat. Chel. &c.* p. 93.
Melanochelys pictus, *Murray, A. M. N. H.* (5) xiv, 1884, p. 107.

Carapace much elevated, with three interrupted keels or series of nodose prominences corresponding to the vertebral and costal shields; posterior border strongly serrated in the young, feebly in the adult; nuchal moderate, broader posteriorly than anteriorly; first vertebral not or scarcely broader anteriorly than posteriorly; second and third vertebrals broader than long in the young, nearly as long as broad in the adult, narrower than the costals. Plastron large, angulate laterally, truncate anteriorly; posterior lobe much narrower than the opening of the shell, nearly as long as the width of the bridge, deeply notched posteriorly. Head rather large; snout very short, not projecting; upper jaw emarginate mesially; the width of the mandible at the symphysis nearly equals the horizontal diameter of the orbit; a large shield, sometimes divided into three, covers the upper surface of the snout and the crown; one shield round the upper jaw and one on each side between the eye and the ear. Digits webbed to the claws. Tail extremely short. Shell dark brown or blackish, elegantly marked with yellow spots and radiating streaks. Soft parts dark brown or blackish, with round yellow spots, largest on the head and neck.

Length of shell 9 inches.

Hab. Bengal, Punjab, Upper Sind.

Genus MORENIA,

Gray, Suppl. Cat. Sh. Rept. i, p. 62, 1870.

Neural plates hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with short axillary and inguinal buttresses, just reaching the first and fifth costal plates; entoplastron anterior to the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces very broad, that of upper jaw with a strong tuberculate median ridge; edge of jaws strongly toothed; choanæ behind the level of the eyes. Upper surface of snout and crown covered with a single shield, behind which the skin is corrugated. Digits extensively webbed. Tail short.

Distribution. Northern India and Burma. Aquatic; herbivorous.

Synopsis of the Species.

Suture between abdominal shields longer than that between pectorals .... *M. ocellata*, p. 35.
Suture between abdominal shields not longer than that between pectorals .... *M. petersii*, p. 36.

32. Morenia ocellata.

Emys ocellata, *Dum. & Bibr. Erp. Gén.* ii, p. 329, pl. xv, fig. 1; *Günth. Rept. B. I.* p. 22.
Emys berdmorei, *Blyth, J. A. S. B.* xxvii, 1858, p. 281.
Morenia berdmorei, *Gray, Suppl. Cat. Sh. Rept.* i, p. 62; *Theob. Cat.* p. 17.
Batagur (Morenia) ocellata, *Anders. An. Zool. Res. Yunnan*, p. 755, pls. lx & lxi.
Morenia ocellata, *Bouleng. Cat. Chel. &c.* p. 66.

Carapace moderately depressed, with a strong, interrupted, tubercular keel in the young, which becomes fainter in the adult; margin not serrated; nuchal narrow; first vertebral not or but little broader anteriorly than posteriorly, lateral borders usually sinuous; second, third, and fourth vertebrals broader than long or as long as broad, narrower than the costals. Plastron large, angulate laterally, truncate anteriorly, notched posteriorly; the width of the bridge exceeds the length of the hind lobe; the longest median suture is that between the abdominals; suture between the gulars as long as that between the humerals or shorter; axillary and inguinal large. Head moderate; snout short, obtuse; upper jaw notched mesially, denticulated; lower jaw strongly serrated, flat beneath, its width at the symphysis equalling the diameter of the orbit. Scales on limbs small; digits broadly webbed. Tail very short. Carapace brown, each shield of the disk with a large central blackish ocellus encircled with yellowish; lower surface uniform yellow. Head olive, with yellow

markings; a yellow streak running above the canthus rostralis, supraciliary edge and temple, and another from behind the eye to above the ear.

Length of shell: ♂ 6 inches, ♀ 9 inches.

Hab. Burma.

33. Morenia petersii.

Emys ocellata (*non D. & B.*), *Blyth, J. A. S. B.* xxvii, 1858, p. 281.
Morenia ocellata, *Theob. Cat.* p. 18.
Batagur (Morenia) petersi, *Anders. An. Zool. Res. Yunnan,* p. 761, pl. lix.
Morenia petersii, *Bouleng. Cat. Chel. &c.* p. 68.

Very closely allied to the preceding. Snout much more pointed and relatively longer. Suture between the pectorals not shorter than that between the abdominals. Carapace black, each vertebral with a narrow yellowish mesial line; the last four vertebrals with a yellowish linear horseshoe mark with the ends directed forwards; each costal with an ocellus placed rather low and formed by a narrow yellowish line, above which are some irregular looped lines of similar colour; the nuchal and each marginal with a vertical narrow yellowish mesial streak; plastron yellow. Three yellow streaks on each side of the head, the lower extending from below the nostril to the angle of the mouth.

Length of shell: ♂ 5 inches, ♀ 8 inches.

Hab. Bengal.

Genus HARDELLA,

Gray, Suppl. Cat. Sh. Rept. i, p. 58, 1870.

Neural plates elongate, hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with extremely developed axillary and inguinal buttresses, the former connected with the first rib, the latter anchylosed between the fifth and sixth costal plates; entoplastron anterior to the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces very broad, that of upper jaw with a strong tubercular median ridge; edge of jaws strongly toothed; choanæ behind the level of the eyes. Upper surface of snout and crown covered with a single shield, behind which the skin is corrugated. Digits extensively webbed. Tail short.

Distribution. Northern India. Thoroughly aquatic; herbivorous.

34. Hardella thurgi.

Emys thurjii, *Gray, Syn. Rept.* p. 22; *id. Ill. Ind. Zool.* i, pl. lxxiii.
Emys thurgii, *Günth. Rept. B. I.* p. 24.

Batagur thurgii, *Theob. Cat. Rept. Mus. As. Soc.* 1868, p. 12; *id. Cat.* p. 23.
Kachuga oldhami, *Gray, P. Z. S.* 1869, p. 200, fig. 14.
Hardella thurgi, *Gray, Suppl. Cat. Sh. Rept.* i, p. 58; *Bouleng. Cat. Chel. &c.* p. 63.
Hardella indi, *Gray, Suppl. Cat. Sh. Rept.* i, p. 58.

Carapace moderately depressed, with an interrupted tubercular keel; margin not serrated; nuchal narrow, broadest posteriorly; first vertebral usually narrower anteriorly than posteriorly, lateral borders usually slightly sinuous; second, third, and fourth vertebrals considerably broader than long in the young, nearly as long as broad in the adult. Plastron large, angulate laterally, truncate anteriorly, angularly notched posteriorly; the width of the bridge exceeds the length of the posterior lobe; the longest median suture is that between the abdominals; suture between the gulars as long as that between the humerals or a little shorter (at least three fourths); inguinal large, axillary smaller. Head moderate; snout short, obtuse; upper jaw notched mesially, serrated; lower jaw very strongly dentated, flat inferiorly, its width at the symphysis a little less than the diameter of the orbit. Limbs with transversely enlarged, band-like scales. Carapace dark brown or black; plastron yellowish, with a large blackish spot occupying the greater part of each shield, or entirely black. Soft parts dark brown; a yellow band across the præfrontal region, extending on each side, through the eye, to above the ear; another from below each eye, passing below the nostrils.

Length of shell 18 inches (♀). Males much smaller.

Hab. Northern India (Ganges and Indus systems).

Genus **BATAGUR**,

Gray, Cat. Sh. Rept. i, p. 35, 1855.

Neural plates elongate, hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with extremely developed axillary and inguinal buttresses, the former connected with the first rib, the latter anchylosed between the fifth and sixth costal plates; entoplastron anterior to the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces very broad, that of the upper jaw with two strong, slightly denticulated median ridges; edge of jaws denticulated; choanæ behind the level of the eyes. Limbs somewhat approaching the paddle-shape, very broadly webbed, with four claws. Tail very short.

Distribution. Bengal, Burma, Malay Peninsula. Thoroughly aquatic; herbivorous.

35. Batagur baska.

Emys batagur, *Gray, Syn. Rept.* p. 23; *id. Ill. Ind. Zool.* ii, pl. lix.
Emys baska, *Gray, Syn. Rept.* p. 24; *id. Ill. Ind. Zool.* i, pl. lxxv.
Tetraonyx baska, *Dum. & Bibr. Erp. Gén.* ii. p. 341; *Theob. Cat.* p. 25.
Tetraonyx batagur, *Gray, Cat. Tort.* p. 29.
Tetraonyx affinis, part., *Cantor, J. A. S. B.* xvi, 1847, p. 612.
Batagur baska, *Gray, Cat. Sh. Rept.* i, p. 35, pl. xvi; *Günth. Rept. B. I.* p. 37, pl. iii, figs. B, B'; *Bouleng. Cat. Chel. &c.* p. 61.

Carapace moderately depressed, with a vertebral keel in the young, which keel disappears in the adult; nuchal broader than long; first vertebral as broad in front as behind, or a little broader; vertebrals 2 to 4 subequal, much broader than long in the young, nearly as long as broad and as broad as the costals in the adult; the postero-lateral border of the third vertebral strongly concave. Plastron large, strongly angulate laterally in the young, convex in the adult, truncate anteriorly, angularly notched posteriorly; the width of the bridge exceeds the length of the posterior lobe; the longest median suture is that between the abdominals, the shortest that between the gulars, the latter never more than half that between the humerals; inguinal large, axillary smaller. Head rather small; snout pointed, produced, directed upwards; jaws with denticulated edge, upper feebly notched mesially; the width of the lower jaw at the symphysis nearly equals the diameter of the orbit. Limbs with transversely enlarged, band-like scales. Upper surface of shell and soft parts olive-brown, lower surface yellowish.

Length of shell 21 inches.

Hab. Bengal, Burma, Malay Peninsula.

Genus KACHUGA,

Gray, Cat. Sh. Rept. i, p. 35, 1855.

Fourth vertebral shield elongate, embracing four or five neural plates; neural plates hexagonal, anterior lateral margins shortest. Plastron extensively united to the carapace by suture, with extremely developed axillary and inguinal buttresses, the former connected with or nearly reaching the first rib, the latter anchylosed between the fifth and sixth costal plates; entoplastron anterior to the humero-pectoral suture. Skull with a bony temporal arch; alveolar surfaces very broad, that of upper jaw with a median ridge; edge of jaws denticulated; choanæ on a level with the posterior border of the eyes, or behind it. Upper surface of head covered with undivided skin. Digits very broadly webbed. Tail very short.

Distribution. India and Burma. Thoroughly aquatic; herbivorous.

Synopsis of the Species.

A. Third vertebral shield forming a broad suture with the fourth, which embraces four neural plates.
  a. Second vertebral shield with straight transverse posterior border.
    a'. Alveolar surface of upper jaw extremely broad, the median ridge nearer the outer than the inner margin; bony choanæ behind the orbits .... *K. lineata,* p. 40.
    b'. Alveolar surface of upper jaw narrower, the median ridge nearer the inner than the outer margin; bony choanæ between the orbits .... *K. trivittata,* p. 41.

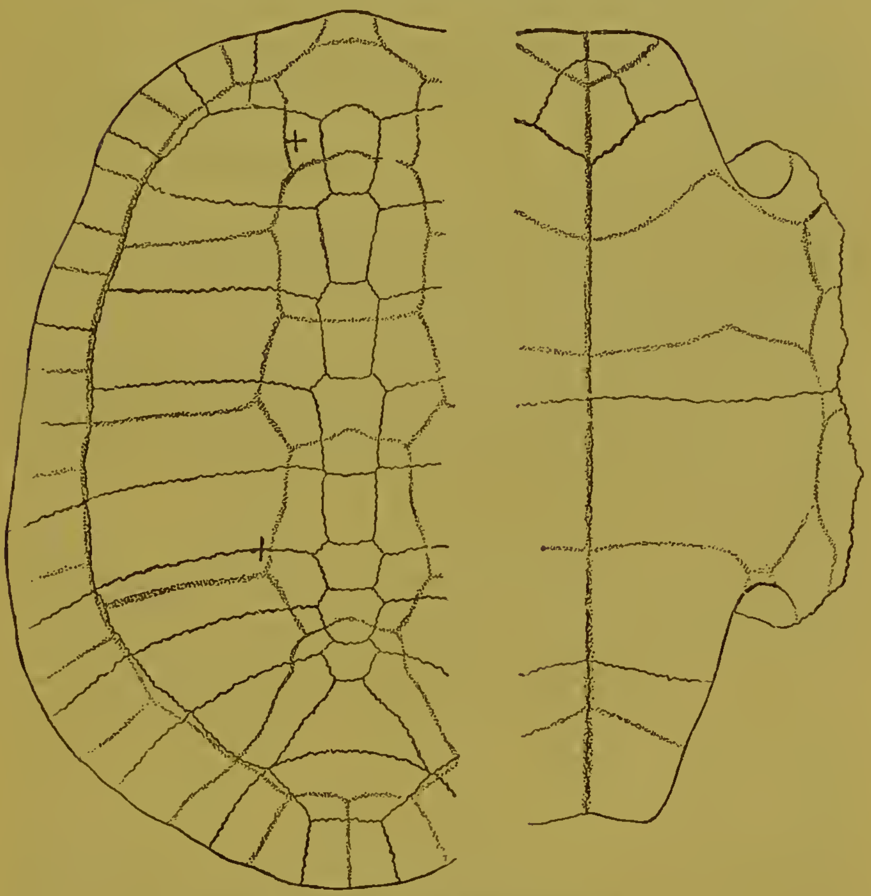


Fig. 12.—Shell of *Kachuga trivittata.*

  b. Second vertebral shield pointed or produced behind, entering the third................ *K. dhongoka,* p. 41.
B. Fourth vertebral shield pointed in front, narrowly in contact with the third, embracing five neural plates.
  a. Third vertebral quadrangular, much longer than broad, posterior border straight or slightly convex .... *K. smithii,* p. 42.

b. Third vertebral shield pentagonal, pointed behind.
  a'. Second vertebral shield much shorter than third, embracing two neural plates.
    a''. Posterior margin of carapace strongly serrated; 26 marginal shields (including caudals) .... *K. sylhetensis*, p. 42.
    b''. Posterior margin not serrated .... *K. intermedia*, p. 43.
  b'. Second vertebral shield as long as broad, embracing three neural plates .... *K. tectum*, p. 43.

36. Kachuga lineata.

Emys dhor, part., *Gray, Syn. Rept.* p. 20.
Emys dentata, part, *Gray, Syn. Rept.* errata, & pls. viii, ix; *id. Ill. Ind. Zool.* ii, pl. lviii, fig. 1.
Emys lineata, *Gray, Syn. Rept.* p. 23.
Emys kachuga, *Gray, Ill. Ind. Zool.* i, pl. lxxiv.
Batagur lineata, *Gray, Cat. Sh. Rept.* i, p. 35, pl. xvii; *Günth. Rept. B. I.* p. 39.
Batagur ellioti, *Gray, P. Z. S.* 1862, p. 264; *Günth. Rept. B. I.* p. 40, pl. iii, figs. A, A'.
Kachuga hardwickii, *Gray, P. Z. S.* 1869, p. 202.
? Kachuga fusca, *Gray, Suppl. Cat. Sh. Rept.* i, p. 56.
Kachuga lineata, *Gray, Suppl. Cat. Sh. Rept.* i, p. 56; *Bouleng. Cat. Chel. &c.* p. 54.
Batagur kachuga, *Theob. Cat.* p. 19.

Carapace of young strongly keeled, the keels tubercular posteriorly on the second and third vertebral shields, posterior margin strongly crenulated; the marginal serrature disappears in adolescent specimens, and the vertebral keel, after being reduced to a series of low knobs, vanishes entirely in the full-grown, the carapace of which is very convex. Nuchal shield small, trapezoid, broadest posteriorly; first vertebral as broad in front as behind, or broader; second vertebral longer than third, with which it forms a straight transverse suture; fourth longest and forming a broad suture with the third; second vertebral broader than long in the young, as long as broad in the adult. Plastron angulate laterally in the young; anterior and posterior lobes rather narrow and shorter than the width of the bridge, truncate anteriorly, openly notched posteriorly; the longest median suture between the abdominals, the shortest between the gulars, which equals about one half that between the humerals; the suture between gulars and humerals forms an obtuse angle, and so does that between humerals and pectorals; inguinal large, axillary smaller. Head moderate; snout obtuse, moderately prominent; jaws with denticulated edge, upper not notched mesially; alveolar surfaces very broad, the median ridge of the upper jaw being somewhat nearer the outer than the inner margin; choanæ behind the line of the posterior borders of the orbits; the width of the lower jaw at the symphysis equals the diameter of the orbit. Limbs with trans-

versely enlarged, band-like scales. Brown above, yellowish below; nape with red longitudinal lines.

Length of shell 15 inches.

Hab. Northern Peninsular India; Ganges, Kistna, and Godávari rivers; Burma.

37. Kachuga trivittata.

Emys trivittata, *Dum. & Bibr. Erp. Gén.* ii, p. 331.
Batagur trivittata, *Theob. Jour. Linn. Soc.* x, 1868, p. 14, *and Cat.* p. 20.
Kachuga peguensis *et* trilineata, *Gray, P. Z. S.* 1869, p. 200.
Batagur iravadica, *Anders. An. Zool. Res. Yunnan*, p. 736, pls. lxiv, lxv, lxviii, & lxix.
Kachuga trivittata, *Bouleng. Cat. Chel. &c.* p. 55.

Differs from the preceding in the much narrower alveolar surface of the jaws, the median ridge of the upper jaw being nearer the inner than the outer margin; choanæ between the orbits; the width of the lower jaw at the symphysis is less than the diameter of the orbit. Considerable uncertainty prevails in the distinction of isolated shells of this species from the preceding. The male *B. trivittata* is characterized by three black longitudimal bands on the carapace, which are absent in the female according to Theobald, whose opinion I am disposed to endorse rather than that of Anderson, who makes a distinct species (*B. iravadica*) for the specimens (females and young males) without bands.

Length of shell 22 inches.

Hab. Irrawaddy river from Bhámo to Rangoon; Tenasserim.

38. Kachuga dhongoka.

Emys dhongoka, *Gray, Ill. Ind. Zool.* ii, pl. lx.
Batagur dhongoka, *Gray, Cat. Sh. Rept.* i, p. 36, pl. xviii; *Günth. Rept. B. I.* p. 42; *Theob. Cat.* p. 22.
Pangshura leithii, *Gray, Suppl. Cat. Sh. Rept.* i, p. 60.
Kachuga dhongoka, *Bouleng. Cat. Chel. &c.* p. 56.

Carapace much depressed, keeled in the young, the keels reduced to a knob on each of the anterior vertebrals in the adult; posterior margin crenulated. Nuchal shield small, trapezoid, broadest behind; first vertebral usually narrower in front than behind, with sinuous lateral borders; second vertebral broader than long in the young, longer than broad in the adult, posterior border pointed or more or less produced, fitting into an emargination of the third vertebral, which is shorter than either the second or the third. Plastron angulate laterally in the young; front lobe truncate, hind lobe angularly notched, shorter than the width of the bridge; the longest median suture is between the abdominals; suture between the gulars as long or nearly as long as that between the humerals; the suture between gulars and humerals forms a right angle, and

that between humerals and pectorals a straight transverse line; inguinal large, axillary smaller. Jaws and soft parts as in *K. trivittata.* Brown above, yellowish below; carapace with three more or less distinct black longitudinal bands.

Length of shell 14 inches.

Hab. Northern India (Ganges and Indus); and Poona in the Deccan, if a specimen obtained by Dr. Leith was correctly labelled.

39. **Kachuga smithii.**

Batagur smithii, *Gray, P. Z. S.* 1863, p. 253.
Pangshura smithii, *Günth. Rept. B. I.* p. 36; *Theob. Cat.* p. 15.
Kachuga smithii, *Bouleng. Cat. Chel. &c.* p. 57, pl. i.

Carapace much depressed, feebly keeled. Nuchal shield small, trapezoidal, broadest posteriorly; first vertebral with sinuous lateral borders, usually a little narrower in front than behind; second vertebral shortest, broader than long, usually with straight or slightly convex posterior border; third vertebral considerably longer than broad, subquadrangular, posterior border straight or slightly convex; fourth vertebral longest, tapering anteriorly and forming a narrow suture with the third; fifth vertebral much broader than the others. Plastron feebly angulated laterally, large; front lobe rounded, hind lobe angularly notched and as long as or a little shorter than the width of the bridge; the longest median suture is that between the abdominals, which about equals the length of the front lobe; gulars usually shorter than the suture between the humerals, their suture with the latter shields forming a right angle; inguinal large, axillary smaller. Head moderate; snout short, obtuse, feebly prominent; jaws with denticulated edge, upper not notched mesially; alveolar surface of upper jaw broad, the median ridge nearer the inner than the outer border; bony choanæ between the orbits; the width of the lower jaw at the symphysis is less than the diameter of the orbit. Fore limbs with large transverse scales. Pale olive-brown above; dorsal keel usually blackish; plastral shields and lower surface of marginals dark brown, bordered with yellow.

Length of shell 8½ inches.

Hab. Upper Ganges and Indus with their tributaries.

40. **Kachuga sylhetensis.**

Pangshura sylhetensis, *Jerdon, P. A. S. B.* 1870, p. 69; *Theob. Cat.* p. 15.
Kachuga sylhetensis, *Bouleng. Cat. Chel. &c.* p. 57.

Carapace elevated, tectiform, the keel ending in an elevated pointed nodosity on the third vertebral shield, forming a strong ridge on the last two vertebrals; posterior margin very strongly serrated; 26 marginal shields, instead of 24 as in all other species of the genus; first vertebral shield much broader in front than behind in the half-grown specimens, equally broad in front and

behind in the adult; second vertebral shortest, broader than long, with straight posterior border; third vertebral considerably longer than broad, pointed behind, and forming a very narrow suture with the fourth, which tapers anteriorly and equals in length the first and second together; fifth vertebral not broader than fourth, pointed posteriorly. Plastron large, feebly angulate laterally, truncate anteriorly, angularly notched posteriorly; the longest median suture is that between the abdominals; suture between the gulars as long as or shorter than that between the humerals; suture between gulars and humerals forming a right angle; inguinal and axillary large. Carapace olive-brown, usually with a lighter streak along the keel; plastral shields dark brown with a broad yellow border.

Length of shell 7 inches.

Hab. Sylhet and Assam.

41. Kachuga intermedia.

Emys (Pangshura) tectum, var. intermedia, *Blanf. J. A. S. B.* xxxix, 1870, pt. 2, p. 339, pl. xiv, and xlviii, 1879, p. 110.
Kachuga intermedia, *Bouleng. Cat. Chel. &c.* p. 58.

Shell as in *K. tectum*, but second vertebral shield shortest and broader than long. Carapace brown; plastral shields black, with yellow anterior and lateral margins. Head dull olive, paler below; a ferruginous spot behind the eye, and three others, less well marked, in a convex line on the occiput; limbs uniform olive.

Length of shell 4½ inches.

Hab. Hasdo river, Bilaspur, Central Provinces; Godávari.

This Tortoise is only known to me from Blanford's description.

42. Kachuga tectum.

Emys tecta, *Gray, Syn. Rept.* p. 23, pl. v; *id. Ill. Ind. Zool.* i, pl. lxxii.
Emys tentoria, *Gray, P. Z. S.* 1834, p. 54.
Pangshura tecta, *Günth. Rept. B. I.* p. 33; *Theob. Cat.* p. 13.
Pangshura tentoria, *Günth. Rept. B. I.* p. 34, pl. iv, figs. C, C′; *Theob. Cat.* p. 14.
Pangshura flaviventer, *Günth. Rept. B. I.* p. 35; *Theob. Cat.* p. 15.
Kachuga tectum, *Bouleng. Cat. Chel. &c.* p. 58.

Carapace elevated, tectiform, the keel ending in a nodosity on the third vertebral shield; posterior margin not or but very slightly serrated; nuchal shield small, square or trapezoidal; first vertebral very variable in shape, usually with straight lateral borders diverging forwards in the half-grown specimens, narrower in front and with sinuous lateral borders in the adult; second vertebral as long as or a little longer than second, frequently obtusely pointed behind; third vertebral pointed behind, in contact with the point of the very elongate fourth; fifth vertebral broader than the others. Plastron large, strongly angulated laterally in the young, truncate anteriorly, angularly notched posteriorly; proportions of

plastral shields very variable; suture between gulars and humerals forming a right angle; axillary and inguinal large. Head moderate; snout short, rather pointed and prominent; jaws with denticulated edge, upper not notched mesially; alveolar surface of upper jaw with the median ridge nearer the inner than the outer border; bony choanæ between the orbits; the width of the lower jaw at the symphysis is less than the diameter of the orbit. Fore limbs with large transverse scales. Carapace olive, that of young with some black spots, especially on the posterior edge of the first three vertebrals; an orange vertebral band and a narrow yellow margin; carapace more uniform in the adult; plastron orange or red, with black spots, or brown with a yellowish anterior and lateral border to each shield, in one specimen uniform yellow. Head blackish; jaws and sides of crown orange; neck with numerous yellow lines on a blackish ground; limbs dark olive, spotted with yellow.

Length of shell up to nearly 9 inches.

Hab. Ganges and Indus systems.

Family III. PLATYSTERNIDÆ.

Shell covered with epidermal shields. Caudal vertebræ mostly opisthocœlous. Neck completely retractile within the shell. Parietal bones widely separated from squamosals; temporal region completely roofed over. Digits moderately elongate; phalanges with condyles; claws four or five.

A single genus and species, remarkable for its large head and long tail.

Genus **PLATYSTERNUM**,

Gray, P. Z. S. 1831, p. 106.

Plastron moderately large, connected with the carapace by ligament; a series of inframarginal shields separates the plastral shields from the marginals. Head very large, covered above with an undivided horny shield; jaws very strong, hooked, without additional alveolar ridges. Digits feebly webbed, all except the outer toe clawed. Tail very long, subcylindrical, compressed at the end, with rings of squarish shields.

A single species.

43. **Platysternum megacephalum.**

Platysternum megacephalum, *Gray, P. Z. S.* 1831, p. 107; *id. Ill. Ind. Zool.* ii, pl. lxii; *Günth. Rept. B. I.* p. 43; *Bouleng. Cat. Chel. &c.* p. 46.

Platysternon peguense, *Gray, Suppl. Cat. Sh. Rept.* i, p. 70; *Theob. Cat.* p. 26.

Carapace much depressed, oval, with a feeble median keel posteriorly; anterior border broadly emarginate. Nuchal shield very small, broader than long; vertebrals broader than long, as broad as the costals or a little narrower, much broader in the young, in which the posterior border of the carapace is distinctly serrated.

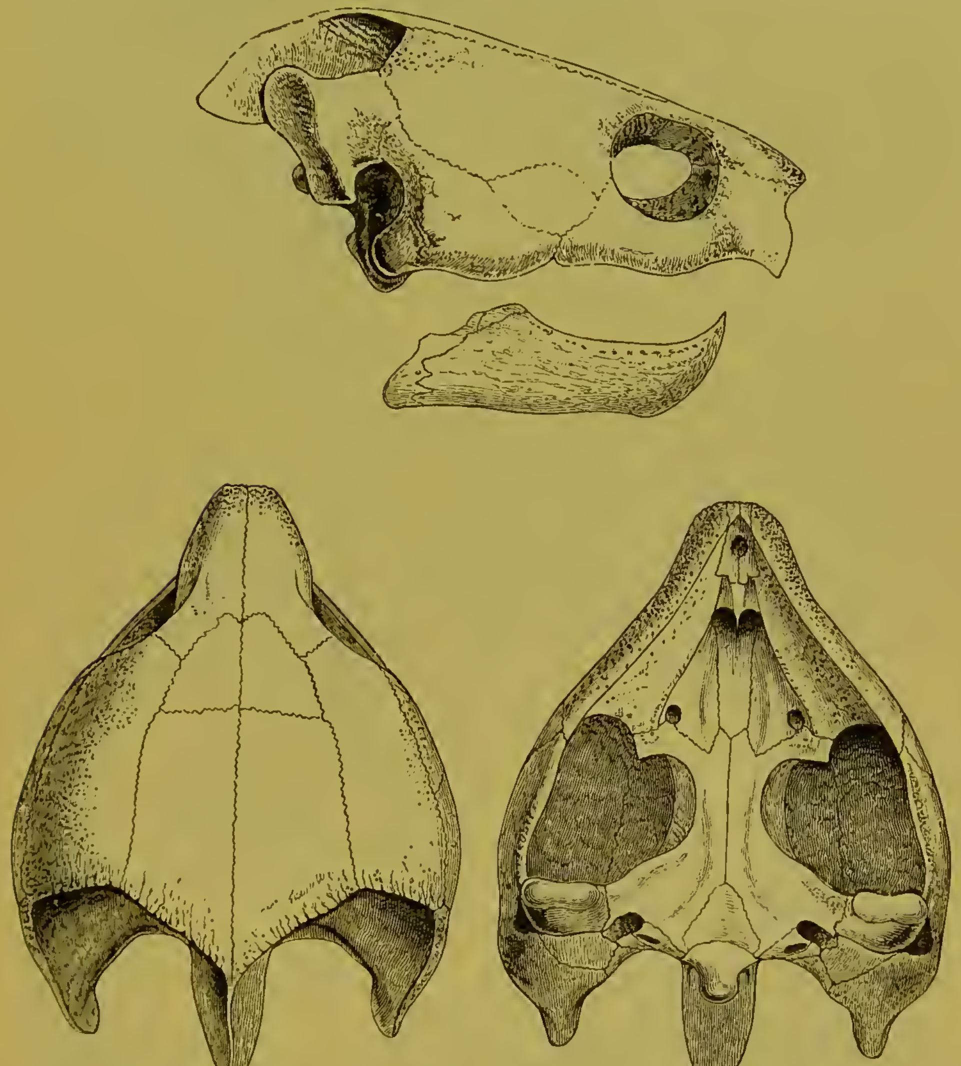


Fig. 13.—Skull of *Platysternum megacephalum.*

Front lobe of plastron squarish, posterior angularly emarginate; the width of the bridge contained four or five times in the length of the plastron; the longest plastral shields are the anals, femorals, and humerals; the shortest the gulars, which occupy, however, the whole width of the front border of the plastron; frequently a small intergular shield between the gulars and the humerals. Upper surface of head and temple with an undivided horny scute.

Throat with round flat tubercles. Anterior surface of arm with large squarish scutes. Hinder side of thighs with large conical tubercles. Tail at least as long as the shell. Carapace and soft parts of adult olive-brown; plastron yellowish brown. Young more elegantly marked:—Upper surface of head and neck and carapace olive-brown, with a few dark brown dots on the crown and one in the centre of each costal scute; the edge of the carapace yellow; jaws yellow: a yellow black-edged streak on each side along the temple; sides and lower surface of neck and limbs whitish; upper surface of limbs blackish: plastron yellow, with a symmetrical black marking along the middle; tail blackish above, yellow with a black median line beneath.

Head and neck 3 inches, carapace 6, tail $6\frac{1}{2}$.

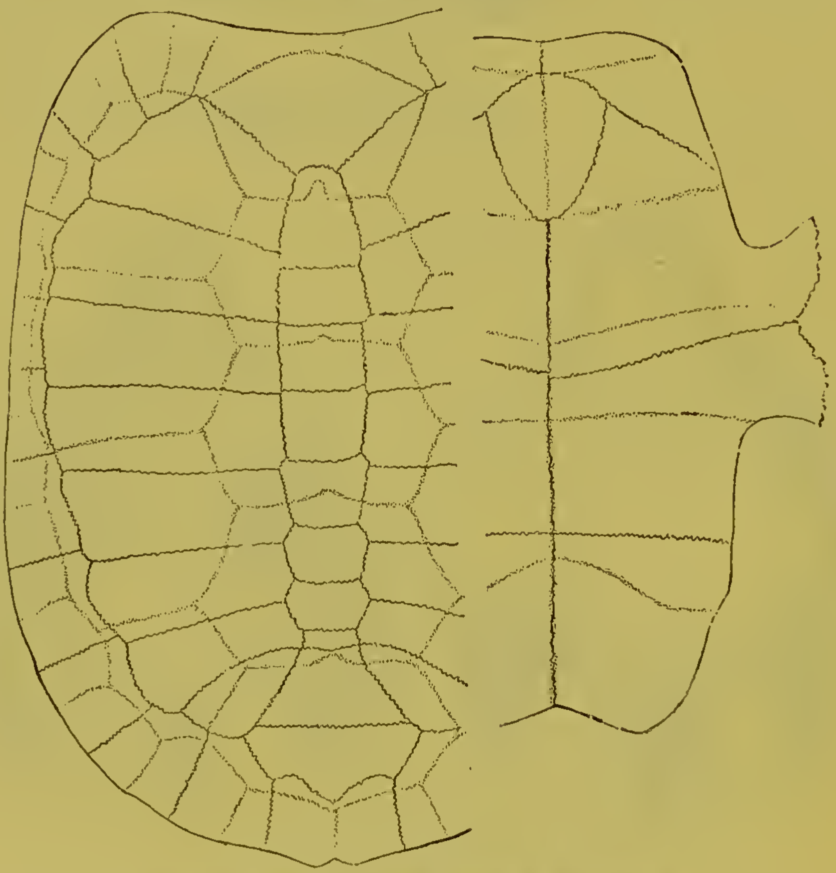


Fig. 14.—Shell of *Platysternum megacephalum.*

A rare tortoise, found in streams in Burma and Siam; the specimens on record are mostly from Pegu and Tenasserim. It is also known from Southern China, where, according to Swinhoe (P. Z. S. 1870, p. 409), it occurs in the western parts of Kwangtung Province and in Kwangse.

Family IV. CHELONIDÆ.

Shell covered with epidermal shields. Caudal vertebræ procœlous. Neck incompletely retractile; cervical vertebræ short.

Fig. 15.—Skull of *Chelone imbricata.*

Temple completely roofed over; parietal bone in contact with the squamosal. Limbs paddle-shaped; phalanges without condyles: claws one or two.

The Marine Turtles belong to three species, falling into two

genera, viz.:—The Green Turtle, *Chelone mydas*, the Hawksbill, *Chelone imbricata*, and the Loggerhead, *Thalassochelys caretta*, all three of which occur in the Indian Ocean. The Green Turtle is valuable as an article of food, the Hawksbill for the tortoise-shell (the epidermal horny shields); whilst the Loggerhead is of no commercial value, or produces but a very inferior quality of tortoise-shell.

The Chelonidæ are thoroughly marine turtles, approaching the shores only for the purpose of depositing their eggs, which are very numerous, soft-shelled, and buried in the sand. As these eggs are large and excellent eating, they are much sought for.

The genera are thus distinguished:—

Costal shields 4 pairs .... CHELONE, p. 48.
Costal shields 5 or more pairs.............. THALASSOCHELYS, p. 49.

Genus **CHELONE**,

Brongniart, Bull. Soc. Philom. iii, 1800, p. 89.

Carapace with persisting fontanelles between the costal and marginal plates. Costal shields four pairs. An intergular shield and a series of inframarginal plastral shields.

Two species are known.

Synopsis of Species.

Upper jaw not hooked .... *C. mydas*, p. 48.
Upper jaw hooked .... *C. imbricata*, p. 49.

44. **Chelone mydas.**

Testudo mydas, *Linn. Syst. Nat.* i, p. 350.
Chelonia mydas, *Schweigg. Prodr.* p. 22; *Bouleng. Cat. Chel. &c.* p. 180.
Chelonia virgata, *Schweigg. Prodr.* p. 22; *Cantor, J. A. S. B.* xvi, 1847, p. 617; *Günth. Rept. B. I.* p. 53; *Theob. Cat.* p. 33.

Carapace feebly unicarinate in the young (sometimes with slight indication of lateral keels), arched or subtectiform in the adult; dorsal shields juxtaposed; margin not or but indistinctly serrated, formed of 25 shields. Snout very short; jaws not hooked; horny sheaths of upper jaw with feebly denticulated edge and striated inner surface, of lower jaw with strongly denticulated edge; alveolar surface of upper jaw with two strong denticulated ridges; symphysis of lower jaw short; one pair of præfrontal shields. Limbs usually with a single claw; the second digit sometimes provided with a distinct claw in young specimens. Young dark brown or olive above, the limbs margined with yellow; yellow beneath, with a large dark brown spot on the hand and foot. Carapace of adult olive or brown, spotted or marbled with yellowish.

Length of shell 4 feet.

Hab. Tropical and subtropical seas. Rather rare in the Bay of Bengal. Herbivorous; edible, but occasionally poisonous.

45. Chelone imbricata.

Testudo imbricata, *Linn. Syst. Nat.* i, p. 350.
Chelonia imbricata, *Schweigg. Prodr.* p. 21; *Bouleng. Cat. Chel. &c.* p. 183.
Eretmochelys squamata, *Agassiz, Contr. N. H. U. S.* i, p. 382.
Caretta squamata, *Günth. Rept. B. I.* p. 54; *Theob. Cat.* p. 33.

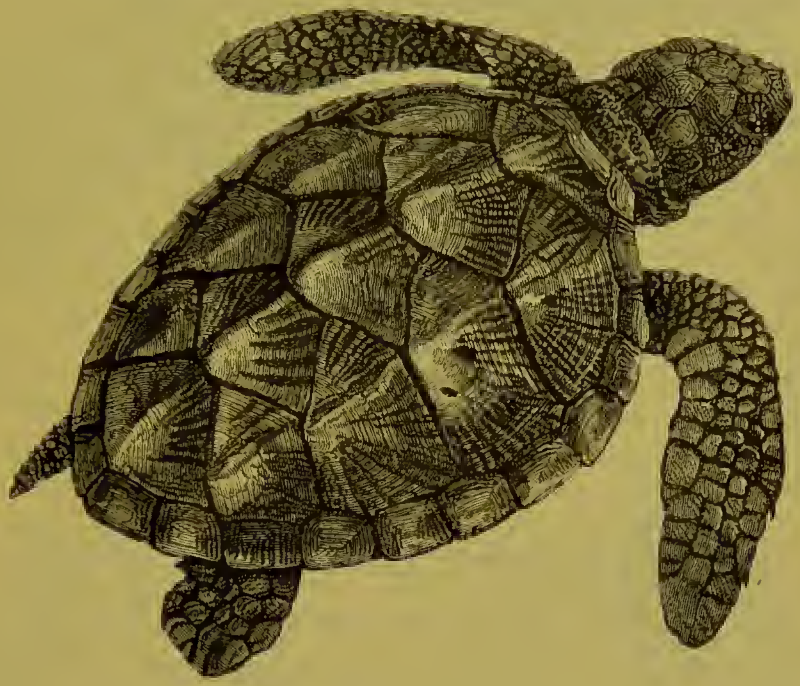


Fig. 16.—*Chelone imbricata* (young).

Carapace tricarinate in the young, with the shields strongly imbricate, the vertebrals rhomboidal; dorsal shields of adult smooth, of old specimens juxtaposed; margin formed of 25 shields, more or less strongly serrated posteriorly. Snout compressed in the adult; jaws hooked, not or but very feebly denticulated on the margin; symphysis of lower jaw long; two pairs of shields anterior to the azygous frontal. Limbs with two claws. Young pale brown above, blackish below. Carapace of adult marbled yellow and dark brown, plastron yellow; shields of head and limbs dark brown with yellow borders.

Length of shell 3 feet.

Hab. Tropical and subtropical seas. Plentiful on the coasts of Ceylon and the Maldives. Carnivorous.

Genus THALASSOCHELYS,

Fitzinger, Ann. Wien. Mus. i, 1835, p. 121.

Carapace completely ossified in the adult. Costal shields five pairs or more. A series of inframarginal plastral shields.

A single species.

46. Thalassochelys caretta.

Testudo caretta, *Linn. Syst. Nat.* i, p. 351.
Chelonia caouanna, *Schweigg. Prodr.* p. 22.
Chelonia olivacea, *Eschsch. Zool. Atl.* p. 3, pl. iii; *Cantor, J. A. S. B.* xvi, 1847, p. 619.
Caouana olivacea, *Günth. Rept. B. I.* p. 52; *Theob. Cat.* p. 33.
Thalassochelys caretta, *Bouleng. Cat. Chel. &c.* p. 184.

Carapace of young with three strong keels, of adult arched or subtectiform; dorsal shields juxtaposed; margin serrated posteriorly in the young, formed of 27, or rarely 25 shields. Intergular shield very small or absent. Head large, with very strong, hooked jaws; symphysis of lower jaw very long; alveolar surface of horny beak with a median ridge, of jaws without; two pairs of shields anterior to the azygous frontal. Limbs of young usually with two claws, of adult frequently with but one. Young uniform dark brown or blackish; adult brown above, yellowish inferiorly.

Length of shell 4 feet.

Hab. Tropical and subtropical seas; Mediterranean; an accidental visitor in the North. Not rare in the Bay of Bengal. Carnivorous, feeding chiefly on crustaceans and mollusca.

Suborder II. *ATHECÆ.*

Family V. SPHARGIDÆ.

Exoskeleton consisting of mosaic-like juxtaposed plates. Plastral elements eight; no entoplastron. Limbs paddle-shaped, clawless, the digits of the fore limb much elongate; phalanges without condyles.

This family contains a single genus and species, the well-known Leathery Turtle.

Genus DERMOCHELYS,

Blainville, Journ. de Phys. lxxxiii, 1816, p. 259.

Dorsal shield completely, ventral shield incompletely bony in the adult, the former with seven, the latter with five keels. Beak with two triangular cusps, between three deep notches; no enlarged alveolar surface, the jaws simply sharp-edged. Head covered with small shields.

47. Dermochelys coriacea.

Testudo coriacea, *Linn. Syst. Nat.* i, p. 350.
Sphargis coriacea, *Gray, Syn. Rept.* i, p. 51.
Dermatochelys coriacea, *Günth. Rept. B.I.* p. 55; *Theob. Cat.* p. 34.
Dermochelys coriacea, *Bouleng. Cat. Chel. &c.* p. 10.

Fore limbs as long as the dorsal shield in the young, shorter in the adult. Colour dark brown, uniform or spotted with yellow;

the longitudinal series of enlarged tubercles and the border of the limbs yellowish in the young.

Grows to a length of 8 feet.

Fig. 17.—Skull of *Dermochelys coriacea* *.

Hab. Generally distributed between the tropics, but scarce everywhere; an accidental visitor to temperate coasts. Of no commercial value. Only on one occasion has this turtle been observed to deposit her eggs on the coast of Tenasserim, on February 1st, 1862, near the mouth of the Yé River (*cf.* Tickell, J. A. S. B. xxxi, 1862, p. 367, with figure of the turtle).

* Figures 4, 7, 8, 9, 10, 11, 12, 13, 14, 15, and 17 are from the British Museum Catalogue of Chelonians &c., 1889, the woodcuts having been, by permission of the Trustees, used in the present work.

Order III. SQUAMATA.

Quadrate bone free distally; no lower temporal arch. Ribs single-headed. No plastron. Teeth not implanted in alveoli. Anal opening transverse. Copulatory organ present, paired.

Three Suborders:—

I. LACERTILIA, *Lizards*.—Nasal bones entering the border of the nasal apertures; pterygoid in contact with quadrate; vomers distinct; mandibular rami united by suture. Pectoral arch or its vestiges present; clavicle present whenever the limbs are developed. Tongue flattened.

II. RHIPTOGLOSSA, *Chameleons*.—Nasal bones not bounding nasal apertures; pterygoid not reaching quadrate; vomer single; mandibular rami united by suture. Clavicle absent; limbs well developed. Tongue vermiform, projectile.

III. OPHIDIA, *Snakes*.—Nasal bones bounding nasal apertures; vomers distinct; mandibular rami connected by ligament. No trace of pectoral arch. Tongue flattened and bifid at the end, and sheathed at the base.

Suborder I. *LACERTILIA*.

Lizards may be distinguished from Snakes, apart from the osteological characters given above, either by the presence of four limbs, or in all the limbless forms, which are not very numerous, by the tongue not being retractile into a basal sheath, as in the *Ophidia*. Eyelids and an ear-opening, absent in all Snakes, are usually, though not always, distinct in limbless Lizards. Only one type of Lizards, the American *Heloderma*, is known to be poisonous.

This suborder is divided into 20 families, of which the following 8 are represented in the Indian fauna.

Synopsis of Indian Families.

A. Tongue smooth or with villose papillæ; clavicle dilated, loop-shaped proximally; no postorbital or postfronto-squamosal arches.

Vertebræ amphicœlian; parietal bones distinct Fam. 1. **Geckonidæ.**
Vertebræ procœlian; parietal single........ Fam. 2. **Eublepharidæ.**

B. Tongue smooth or with villose papillæ; clavicle not dilated proximally.

Postorbital and postfronto-squamosal arches present; supratemporal fossa not roofed over by bone; tongue thick; acrodont ....Fam. 3. **Agamidæ.**
Postorbital and postfronto-squamosal arches present; supratemporal fossa roofed over; body with

osteodermal plates, each provided with a system of irregularly arranged arborescent or radiating tubules; anterior portion of tongue retractile; pleurodont .... Fam. 4. **Anguidæ.**

Postorbital arch incomplete; postfronto-squamosal arch present; supratemporal fossa not roofed over; nasal bone single; tongue deeply bifid, sheathed posteriorly .... Fam. 5. **Varanidæ.**

C. Tongue covered with imbricate scale-like papillæ or with oblique plicæ; clavicle dilated proximally, frequently loop-shaped.

Postorbital and postfronto-squamosal arches present; supratemporal fossa roofed over; præmaxillary single; no osteodermal plates on the body. Fam. 6. **Lacertidæ.**

Postorbital and postfronto-squamosal arches present; præmaxillary double; body with osteodermal plates, each provided with a regular system of tubules (a transverse one anastomosing with longitudinal ones) .... Fam. 7. **Scincidæ.**

No interorbital septum; no columella cranii; no arches; præmaxillary double; no osteodermal plates .... Fam. 8. **Dibamidæ.**

The following is an artificial key, based upon characters which are readily observable without any knowledge of the internal structure of the animals, and by which any Lizard occurring within the area ascribed to this fauna may be referred to the family to which it belongs:—

A. Tongue smooth or with villose papillæ, short or moderate, not sheathed at the base (see fig. 20, p. 55).

a. Head covered with granules or small scales; body without bony armour.

No movable eyelids .... 1. **Geckonidæ**, p. 54.

Movable, connivent eyelids; dorsal scales granular and tubercular, round, juxtaposed; pupil vertical .... 2. **Eublepharidæ**, p. 107.

Movable, connivent eyelids; dorsal scales mostly imbricate; pupil round .... 3. **Agamidæ**, p. 109.

b. Head with symmetrical shields above; body rigid, with bony plates underlying the scales .... 4. **Anguidæ**, p. 158.

B. Tongue much elongate, sheathed at the base, similar to that of Snakes; head covered with small scales .... 5. **Varanidæ**, p. 160.

C. Tongue covered with imbricate scale-like papillæ (see fig. 51, p. 167) or oblique plicæ; head with symmetrical shields.

a. Eyes exposed.

Ventral scales much differentiated from the dorsals; femoral or præanal pores .... 6. **Lacertidæ**, p. 167.

Body covered with cycloid imbricate scales; no femoral or præanal pores 7. **Scincidæ**, p. 180.

Eyes hidden under the shields .... 8. **Dibamidæ**, p. 229.

Family I. GECKONIDÆ.

Skull without postorbital or postfronto-squamosal arch; no squamosal; præmaxillary single; nasals distinct; parietals distinct; frontals completely surrounding the olfactory lobes of the brain; a fibro-cartilaginous interorbital septum; a columella cranii;

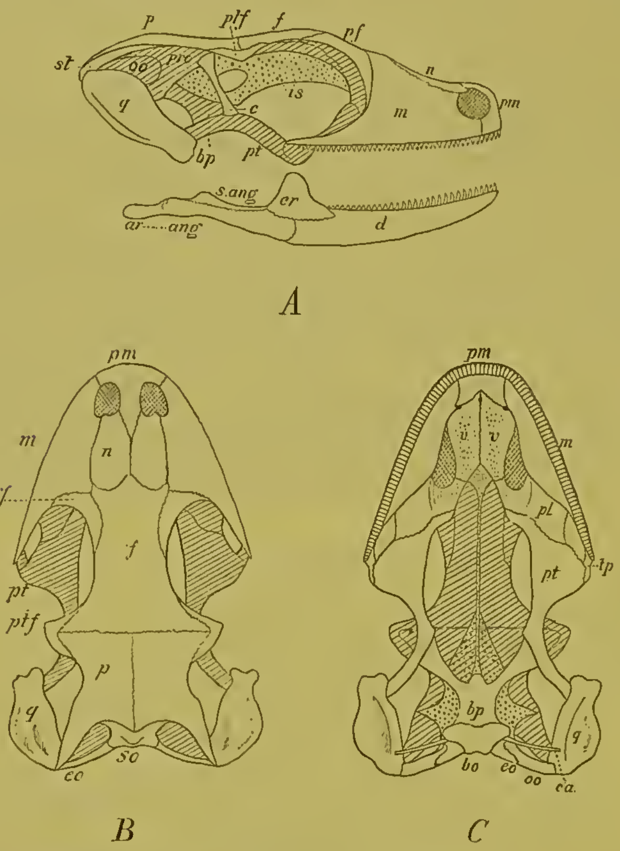


Fig. 18.—Skull of *Gecko verticillatus*.

A. Side view.	B. Upper view.	C. Lower view.
ang. Angular.	*f.* Frontal.	*pro.* Prootic.
ar. Articular.	*is.* Interorbital septum.	*pt.* Pterygoid.
bo. Basioccipital.	*m.* Maxillary.	*ptf.* Postfrontal.
bp. Basisphenoid.	*n.* Nasal.	*q.* Quadrate.
c. Columella cranii.	*oo.* Opisthotic.	*s.ang.* Supra-angular.
c.a. Columella auris.	*p.* Parietal.	*so.* Supraoccipital.
cr. Coronoid.	*pl.* Palatine.	*st.* Supratemporal.
d. Dentary.	*pm.* Præmaxillary.	*tp.* Transpalatine.
eo. Exoccipital.	*prf, pf.* Præfrontal.	*v.* Vomer.

mandible containing only five bones, the angular and articular having coalesced. Teeth small, numerous, with cylindrical shaft anchylosed to the inner edge of the jaws (Pleurodont dentition);

no teeth on the palate. No dermal ossifications on the haed or body. Vertebræ amphicœlous (biconcave). Clavicle dilated and perforated proximally; interclavicle rhomboidal or cruciform.

Tongue moderately elongate, very feebly incised anteriorly, smooth or villose. Eye usually large, frequently with vertical pupil, without connivent eyelids (except in the Malay genus *Æluroscalabotes*). Ear distinct (except in *Teratolepis*), Scales soft, granular or tubercular on the upper surfaces, usually roundish or

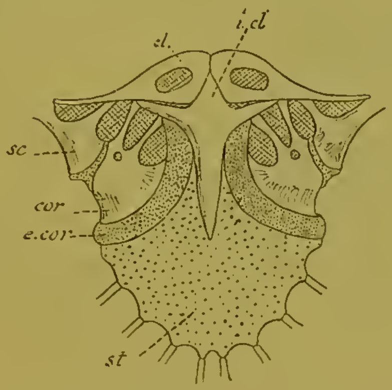


Fig. 19.—Pectoral arch of *Gecko verticillatus*. Fig. 20.—Tongue of same.

cl. Clavicle. *i.cl.* Interclavicle. *e.cor.* Epicoracoid.
cor. Coracoid. *st.* Sternum. *sc.* Scapula.

hexagonal and imbricate on the lower surfaces; in *Teratolepis*, and in a few non-Indian genera, the back is covered with large imbricate scales. No symmetrical shields on the crown. Limbs well developed; digits often dilated. Femoral or præanal pores frequently present, but only in the males. Tail fragile (except in *Agamura*).

With the exception of members of the genera *Gonatodes*, *Pristurus*, and *Phelsuma*, all Indian Geckos are more or less nocturnal. They are mostly oviparous, the eggs being round and hard-shelled; the only species at present known to be ovoviviparous are the New Zealand *Naultinus elegans* and *Hoplodactylus pacificus*.

The *Geckonidæ*, of which about 280 species are known, occur all over the hotter parts of the world. They are most numerous in the Indian and Australian regions.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Digits not or but very slightly dilated, all clawed.
  a. Digits straight, not angularly bent at any of the articulations.
    a'. Digits fringed laterally .... STENODACTYLUS, p. 56.
    b'. Digits not fringed laterally .... ALSOPHYLAX, p. 58.

b. Digits angularly bent, thus composed of a basal and a terminal portion.	
a'. Pupil vertical.	
a''. Tail fragile	GYMNODACTYLUS, p. 59.
b''. Tail very thin, not fragile	AGAMURA, p. 71.
b'. Pupil round.	
a''. Tail compressed, crested	PRISTURUS, p. 72.
b''. Tail neither compressed nor crested	GONATODES, p. 73.
B. Digits with strong dilatations.	
a. Digits clawed; pupil vertical.	
a'. Digits not dilated at the base, ending in a subtriangular or heart-shaped expansion divided beneath by a longitudinal groove into which the claw is retracted.	
a''. Digital expansions with two plates beneath; the penultimate joint with an expansion similar to the distal	CALODACTYLUS, p. 80.
b''. Each digit with only one expansion, which is furnished beneath with fine lamellæ	PTYODACTYLUS, p. 81.
b'. Digits dilated at the base, the distal joint compressed.	
a''. The distal joint long, free, rising from within the extremity of the digital expansion.	
α. Inner digit with compressed, clawed phalanx; dorsal scales granular or tubercular	HEMIDACTYLUS, p. 82.
β. Inner digit with compressed, clawed phalanx; dorsal scales large, imbricate	TERATOLEPIS, p. 96.
γ. Inner digit clawless	GEHYRA, p. 96.
b''. The distal joint at the extremity of the digital expansion.	
α. Digits free or slightly webbed.	
α'. A double series of subdigital lamellæ; inner digit clawless	LEPIDODACTYLUS, p. 97.
β'. A single series of subdigital lamellæ; inner digit with compressed, clawed phalanx	HOPLODACTYLUS, p. 100.
γ'. A single series of subdigital lamellæ; inner digit clawless. .	GECKO, p. 101.
β. Digits entirely webbed	PTYCHOZOON, p. 104.
b. Digits clawless; pupil round	PHELSUMA, p. 105.

Genus STENODACTYLUS,

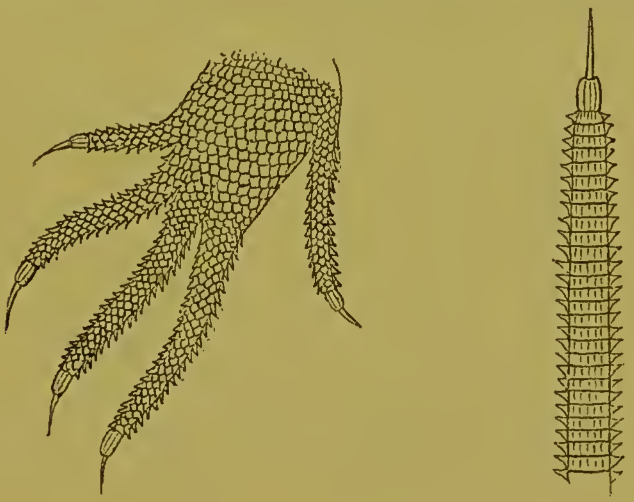
Fitzinger, N. Classif. Rept. p. 13, 1826.

Digits not dilated, nor bent at any of the articulations, furnished with a long claw, and a lateral fringe or denticulation of pointed scales; beneath with a series of keeled scales. Body covered with juxtaposed or subimbricate scales. Pupil vertical. No præanal or femoral pores.

This genus is restricted to the desert districts of North Africa and Southern Asia eastwards to Sind. Six species are known, two of which fall within the geographical limits assigned to this work.

Synopsis of Indian Species.

Snout as long as distance between orbit and ear-opening; ventral scales keeled .... *S. orientalis*, p. 57.
Snout much longer than distance between orbit and ear-opening; ventral scales smooth ...... *S. lumsdenii*, p. 58.



a *b*

Fig. 21.—*Stenodactylus orientalis.*
a. Foot. *b.* Lower surface of toe.

48. Stenodactylus orientalis.

Stenodactylus orientalis, *Blanf. J. A. S. B.* xlv, 1876, pt. 2, p. 21, pl. i, fig. 2; *Murray, Zool. Sind*, p. 363; *Bouleng. Cat. Liz.* i, p. 16, pl. iii, fig. 1.
Stenodactylus dunstervillei, *Murray, l. c. & erratum.*

Head rather depressed, regularly oviform; snout slightly longer than the diameter of the orbit, as long as the distance between the latter and the ear-opening; forehead very slightly concave; ear-opening an oblique slit measuring two-thirds the diameter of the eye. Body moderate, depressed. Limbs moderate; digits elongate, depressed, with well-developed lateral fringes; the transverse inferior lamellæ quinquecarinate. Head covered with small granules, which are feebly keeled on the snout and between the eyes; rostral quadrangular, broader than long, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; twelve upper and thirteen lower labials; mental broader than long, subpentagonal, the lower angle rounded; no chin-shields. Body covered with small granules, keeled on the

ventral region, intermixed with small, keeled, irregularly scattered roundish tubercles on the back. Tail cylindrical, tapering to a fine point, covered with small keeled scales arranged in rings. Colour pale sandy, with indistinct darker transverse bands; a darker line from the eye down each side; dorsal tubercles darker; lower surfaces whitish.

From snout to vent 1·9 inch; tail 1·4.

Hab. Sind, in sandy deserts.

49. Stenodactylus lumsdenii.

Stenodactylus lumsdenii, *Bouleng. Cat. Liz.* iii, p. 479, *and Tr. Linn. Soc.* v, 1889, p. 94, pl. ix, fig. 1.

Snout much longer than the diameter of the orbit or the distance between the orbit and the ear; forehead very slightly concave; ear-opening vertically oval, one third the diameter of the eye. The fore limb, stretched forwards, reaches the tip of the snout; the hind limb reaches the shoulder. Digits slender, shortly fringed laterally, with feebly tricarinate inferior lamellæ. Head covered with small granules, intermixed with enlarged ones on the vertex, the occiput, and the temples; rostral quadrangular, nearly as broad as long, with median cleft above; nostril pierced between the rostral, the first labial, and two nasals; 10 upper and 9 lower labials; mental trapezoid, broader than long; no chin-shields; gular granules minute. Back covered with small granules intermixed with oval, very feebly keeled tubercles, forming about twelve irregular longitudinal series. Ventral scales small, smooth, subhexagonal, imbricate. Tail cylindrical, slightly depressed, verticillate, with subequal, feebly keeled scales. Sand-coloured above, with seven darker bands across the body, and dark brown bands across the tail; head marbled with dark brown; a dark brown band from the eye to above the ear; lower surfaces white.

From snout to vent 1·4 inches; tail 1·7.

Differs from *S. orientalis* by the much longer snout, longer limbs, larger and more numerous dorsal tubercles, smooth ventral scales, &c.

Hab. North Baluchistan, in the sandy desert between Nushki and the Helmand.

Genus ALSOPHYLAX,

Fitzinger, Syst. Rept. p. 90, 1843.

Digits not dilated, nor bent at any of the articulations, clawed, not denticulated laterally, with a series of smooth or tuberculate lamellæ beneath. Body covered above with juxtaposed scales intermixed with enlarged tubercles, below with imbricate scales. Pupil vertical. Males with præanal pores.

Distribution. Arid districts of Turkestan, Egypt, Arabia, Persia, Baluchistan, and Sind. Six species are known, of which only one has to be dealt with here.

50. Alsophylax tuberculatus.

Bunopus tuberculatus, *Blanf. A. M. N. H.* (4) xiii, 1874, p. 454; *id. Eastern Persia*, ii, p. 348, pl. xxii. fig. 4; *Murray, Zool. Sind*, p. 364.
Alsophylax tuberculatus, *Bouleng. Cat. Liz.* i, p. 20.

Head moderate; snout obtuse, a little longer than the diameter of the orbit or the distance between the eye and the ear-opening; forehead very slightly concave; ear-opening elliptic, vertical, nearly half the diameter of the eye. Body moderately depressed. Limbs moderate; digits slender, the inferior lamellæ furnished with projecting tubercles. Head covered with large granules, smaller and intermixed with round tubercles on the temporal and occipital regions; rostral subquadrangular, not much broader than deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; about 10 or 12 upper and 8 to 10 lower labials; mental subtrapezoid, broader than long; no chin-shields; gular granules minute. Back covered with small irregular flat granules, intermixed with large trihedral tubercles, forming about fourteen irregular longitudinal series. Abdominal scales rather small, subhexagonal. Males with 7 or 8 præanal pores, forming a slightly angular series. Tail cylindrical, slightly depressed, verticillate, with rings of keeled tubercles; no enlarged scales inferiorly. Colour sandy, with darker spots which may more or less take the form of cross-bands on the back and tail; a darker streak on the side of the head, passing through the eye, sometimes meeting its fellow on the occiput, sometimes extending to the side of the body; lower surfaces white.

From snout to vent 2·1 inches; tail 2.

Hab. Abounds in parts of Baluchistan, under 3000 feet of elevation, being found in houses and under stones on hill-sides, &c. Occurs also in Sind, in South-eastern Persia, and on the coasts of the Persian Gulf.

Genus GYMNODACTYLUS,

Spix, Spec. nov. Lacert. p. 17, 1825.

Digits not dilated, clawed, cylindrical or slightly depressed at the base; the two or three distal phalanges compressed, forming an angle with the basal portion of the digits; the claw between two enlarged scales, the lower of which is more or less deeply notched under the claw; digits beneath with a row of more or less distinct, transverse plates. Body variously scaled. Pupil vertical. Males with or without præanal or femoral pores.

Distribution. Borders of the Mediterranean; Southern Asia; Australia; islands of the Pacific; Tropical America. Some 37 species are known.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Large trihedral tubercles forming straight series along back.
- *a*. Diameter of dorsal tubercles more than half that of eye; male with over 30 femoral pores, continuous in præanal region . . . . *G. fedtschenkoi*, p. 61.
- *b*. Diameter of dorsal tubercles less than half that of eye; male with 4 to 6 præanal pores.
  - *a'*. About 20 imbricate scales across middle of belly.
    - *a''*. Dorsal tubercles much larger than ear-opening . . . . *G. scaber*, p. 62.
    - *b''*. Dorsal tubercles nearly equal to small ear-opening in size . . . . . . *G. brevipes*, p. 63.
  - *b'*. About 30 imbricate scales across middle of belly; dorsal tubercles a little larger than ear-opening. . . . *G. kachhensis*, p. 63.

B. Enlarged dorsal tubercles, if present, not forming straight longitudinal series.
- *a*. No lateral fold.
  - *a'*. Back covered with uniform granules, which are smaller than the ventral scales, or with scattered slightly enlarged tubercles.
    - *a''*. Tail swollen, depressed, ringed, with enlarged tubercles at each side of each ring . . . . *G. stoliczkæ*, p. 63.
    - *b''*. Tail cylindrical, without tubercles; nostril pierced between rostral, 1st labial, and only two scales; male with præanal pores . . . . *G. lawderanus*, p. 64.
    - *c''*. Tail cylindrical, without tubercles; nostril pierced between rostral, the 1st labial, and several scales; no præanal or femoral pores . . . . . . *G. nebulosus*, p. 64.
  - *b'*. Back covered with juxtaposed uniform flat scales or tubercles, which are much larger than the ventrals.
    - *a''*. Seven lower labials; back and tail with large dark spots . . . . *G. jeyporensis*, p. 65.
    - *b''*. Nine to eleven lower labials; back and tail with transverse white bands . . . . *G. deccanensis*, p. 66.
  - *c'*. Back granular, with numerous feebly keeled or trihedral tubercles.
    - *a''*. Back with tubercles of unequal size; ventral scales tubercular, slightly keeled. . . . . *G. albofasciatus*, p. 66.
    - *b''*. Back with about 30 longitudinal series of tubercles contained between an area bounded by faint keels margining the belly . . . . . . *G. oldhami*, p. 67.

c″. Back with numerous small trihedral tubercles .... *G. triedrus*, p. 67.

b. A sight fold from axilla to groin.

a′. Enlarged dorsal tubercles small, round, smooth; male with two pairs of præanal pores .... *G. frenatus*, p. 68.

b′. Dorsal tubercles small, round, feebly keeled.

a″. About 35 scales across middle of belly, between lateral folds.

α. Subdigital lamellæ occupying nearly the whole width of the digits; male without pubic groove, with 10 to 13 præanal pores .... *G. khasiensis*, p. 68.

β. Subdigital lamellæ considerably narrower than the digits; male with a longitudinal groove on the pubic region, containing 12 pores .... *G. rubidus*, p. 69.

b″. About 25 scales across middle of belly; male with a pubic groove containing pores and a long series of femoral pores .... *G. pulchellus*, p. 69.

c′. Dorsal tubercles large, trihedral.

a″. About 25 scales across middle of belly; male with 16 femoro-præanal pores on each side.......... *G. variegatus*, p. 70.

b″. About 35 scales across middle of belly; male with 5 or 6 præanal pores on each side.............. *G. fasciolatus*, p. 71.

Fig. 22.—*Gymnodactylus khasiensis.* Foot and lower and side views of toe.

51. Gymnodactylus fedtschenkoi.

Gymnodactylus geckoides (*non Spix*), *Blyth, J. A. S. B.* xxii, 1853, p. 410.

Gymnodactylus caspius (*non Eichw.*), *Stoliczka, P. A. S. B.* 1872, p. 80; *Theob. Cat.* p. 91.

Gymnodactylus fedtschenkoi, *Strauch, Mém. Ac. St. Pétersb.* xxxv, 1887, p. 46; *Boettg. Zool. Jahrb.* iii, 1888, p. 884.

In general character allied to *G. kachhensis*, but the shields on the top and sides of head are coarser and carinated, the enlarged tubercles on the body larger and closer together, in about 12 longitudinal series, separated by one or two rows of minute granular scales, and each of the trihedral tubercles is as large as the opening of the ear; tail verticillate, above with similar sharply keeled tubercles; a row of enlarged subcaudals; about eleven upper and eight or nine lower labials; two pairs of enlarged chin-shields; 18–20 longitudinal rows of scales across the belly, with several rows of small scales at the sides; 32–34 femoral pores (in the males) continuous in the præanal region. The fore limb reaches to half the length of the snout, or the end of it, and the hind limb is somewhat more than half the length of head and body. The colour resembles *kachhensis*, there being five or six indistinct transverse rows of dark brown spots on the upper side.

The above description is that given by Stoliczka from specimens obtained in the Punjab Salt Range and referred by him to Eichwald's *G. caspius*. It appears certain, from recent remarks by Strauch, that the Punjab form is not *G. caspius*, but very probably the Turkestan *G. fedtschenkoi*, recently distinguished from *G. caspius*. However, neither Strauch nor I myself have been fortunate enough to examine Punjab specimens.

52. Gymnodactylus scaber.

Stenodactylus scaber, *Rüpp. Atlas, Rept.* p. 15, pl. iv, fig. 2.
Gymnodactylus scaber, *Bouleng. Cat. Liz.* i, p. 27.

Head moderate; snout slightly longer than the diameter of the orbit, longer than the distance between the eye and the ear-opening; eye large, forehead very slightly concave; ear-opening rather small, elliptical, vertical. Body moderate. Limbs long, the fore limb reaching as far as the tip of the snout, the hind limb reaching articulation of neck; digits long and slender, cylindrical at the base, with well-developed lamellæ below. Snout covered with large convex polygonal granules; hinder part of head with small granules intermixed with roundish tubercles; rostral quadrangular, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; ten upper and eight or nine lower labials; mental triangular or pentagonal, not longer than broad; two pairs of chin-shields, median largest and forming a suture behind the point of the mental. Body covered above with irregular small flat scales and large trihedral subtriangular tubercles, forming 12 or 14 longitudinal series; these tubercles are not so large as in *G. fedtschenkoi*, though, as in that species, much larger than the interspaces between them, the diameter of the largest not quite equal to half that of the eye; they are strongly keeled. Abdominal scales large, cycloid-hexagonal, imbricate, smooth, in about 20 longitudinal series in the middle of the belly. Male with five or six præanal pores. Tail feebly depressed, tapering, above with rows of large spinose trihedral tubercles, beneath

with a median series of enlarged transverse plates. Sandy-coloured above, brown-spotted; tail with brown annuli; lower surfaces white.

From snout to vent 1·85 inches; tail 2·3.

Hab. From Egypt southwards to Abyssinia and eastwards to Afghanistan and Sind (Sukkur and Laki).

53. Gymnodactylus brevipes.

Gymnodactylus brevipes, *Blanf. A. M. N. H.* (4) xiii, 1874, p. 453, *and E. Persia,* ii. p. 344, pl. xxii, fig. 2; *Bouleng. Cat. Liz.* i, p. 28.

Differs from *G. scaber* in the following points:—Limbs shorter; the fore limb reaches to between the eye and the tip of the snout, the hind limb to the shoulder. Dorsal tubercles small, nearly equal to the small ear-opening in size, forming ten longitudinal series. Nine upper and seven lower labials. Præanal pores four. The enlarged plates on the lower surface of the tail are about equally long and broad, and many of them are divided into two. Colour grey, with three rather imperfect longitudinal dusky bands on the back, formed of arrow-head-shaped marks; a dusky line, not very strongly marked, from the eye to the shoulder.

Hab. Baluchistan. The only specimen known was obtained in an open sandy plain, with scattered vegetation, not far from Bampur, at an elevation of 3000 feet.

54. Gymnodactylus kachhensis.

Gymnodactylus kachhensis, *Stoliczka, P. A. S. B.* 1872, p. 79; *Theob. Cat.* p. 82; *Bouleng. Cat. Liz.* i, p. 29.

Gymnodactylus petrensis, *Murray, Zool. Sind,* p. 362, pl. —. fig. 1.

Allied to the preceding species. Body rather short; fore limb reaching as far as the tip of the snout or a little beyond, hind limb to constriction of neck. Dorsal tubercles in 12 or 14 longitudinal series, smaller than those of *G. scaber*, similar in shape. Abdominal scales in about 30 longitudinal rows. No regular series of subcaudal plates. Præanal pores four to six. Ten or eleven upper and eight to ten lower labials. Ear-opening narrow, vertical. Sandy-coloured above, with rather indistinct darker spots on body and limbs and annuli on the tail.

From snout to vent 1·6 inches.

Hab. Cutch, Sind, and N.E. Baluchistan (Quetta). Common in Cutch, mostly in crevices of rocks, and very rarely in houses.

55. Gymnodactylus stoliczkæ.

Gymnodactylus stoliczkæ, *Steind. Novara, Rept.* p. 15, pl. ii, fig. 2; *Bouleng. Cat. Liz.* i, p. 31.

Cyrtodactylus yarkandensis, *Anders. P. Z. S.* 1872, p. 381, fig.

Head moderate, oviform, much depressed; snout much longer than the diameter of the orbit, slightly longer than the distance between the eye and the ear-opening; latter very small, suboval. Limbs rather long; digits long, slender, slightly depressed at the base, inferiorly with well-developed lamellæ. Body much depressed. Head and body covered with rather large, flat, round granules, some of which are slightly enlarged and generally tubercular. Rostral subpentagonal, with median cleft above; nostril between the rostral, the first labial, and three nasals; 10 upper and 9 lower labials; mental large, triangular, a little longer than broad; two or three pairs of chin-shields, median largest and forming a short suture behind the mental. Abdominal scales moderate, subhexagonal, slightly imbricate. No femoral or præanal pores. Tail swollen, depressed, about as long as head and body, ringed, with three enlarged blunt tubercles at each side of the ring. Grey above, with darker wavy cross bands on the back.

From snout to vent 1·6 inches.

Hab. Upper Indus valley in Ladák.

56. Gymnodactylus lawderanus.

Gymnodactylus lawderanus, *Stoliczka, J. A. S. B.* xli, 1872, p. 105, pl. ii, fig. 4; *Theob. Cat.* p. 81; *Bouleng. Cat. Liz.* i, p. 32.

Body rather slender and elongate, depressed, covered above with numerous granules intermixed with small roundish tubercles. Upper side of head equally granular, the granular scales being somewhat larger on the snout. Rostral large, broad; nostril pierced between the rostral, the first labial, and two nasals; 9 upper and 8 lower labials; mental triangular, partially wedged in between two elongate chin-shields, forming a suture below it; each of the chin-shields is followed along the labials by three other somewhat rounded shields. Ear-opening small, rounded. Ventral scales small. Two pairs of præanal pores in the male, close together, and forming an angle. General colour above greyish brown, very densely marbled and spotted with dark brown, with some indistinct undulating, whitish cross bands on the body, margined on the anterior edges with blackish brown; a somewhat indistinct dark band from the nostril through the eye to the ear; front and hind edges of the eye white; labials spotted and speckled with brown; below whitish.

Length of body nearly 2 inches.

Hab. Almora, Kumaun.

57. Gymnodactylus nebulosus.

Gymnodactylus nebulosus, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 84; *Bouleng. Cat. Liz.* i, p. 34, pl. iv, fig. 1.
Gymnodactylus speciosus, *Bedd. l. c.*; *Theob. l. c.* p. 83.
Gymnodactylus collegalensis, *Bedd. l. c.*; *Theob. l. c.*

Head rather large, oviform, generally very convex, sometimes

more depressed; snout longer than the diameter of the orbit or the distance between the eye and the ear-opening; forehead slightly concave; ear-opening elliptical, oblique, one third to one half the diameter of the eye. Body rather short, not much depressed. Limbs moderate; digits short, thick, slightly depressed at the base, compressed at the end, beneath with enlarged plates. Head covered with granules, which are larger on the snout; rostral quadrangular, generally nearly twice as broad as deep; nostril pierced between the rostral, the first labial, and several small scales; 9 to 11 upper and 7 to 9 lower labials; mental triangular; a pair of large chin-shields forming a suture behind the point of the mental, surrounded by several smaller shields. Upper surface of body covered with small granules, which are uniform or intermixed with more or less numerous, irregularly scattered, small roundish keeled tubercles. Abdominal scales small, cycloid, imbricate, smooth. No femoral or præanal pores. Tail cylindrical, tapering, probably prehensile, covered with small imbricate smooth scales, largest below. Pale brownish above, variously ornamented with brown spots or cross bands becoming blackish towards their borders and more or less distinctly finely margined with lighter; head marbled or elegantly marked with insuliform brown spots, with a brown band passing through the eye; lower surfaces whitish, the throat reticulated with brown, which reticulation has a tendency to form oblique lines.

From snout to vent 2 inches; tail 1·7.

Hab. India south of 20°, and Ceylon; found in the daytime under stones or dead trees, in forests.

58. Gymnodactylus jeyporensis.

Gymnodactylus jeyporensis, *Beddome, P. Z. S.* 1877, p. 685; *Bouleng. Cat. Liz.* i, p. 36, pl. iv, fig. 2.

Head rather large, oviform; snout longer than the diameter of the orbit or the distance between the eye and the ear-opening; forehead and loreal region slightly concave; ear-opening an oblique slit, three fifths the diameter of the eye. Body depressed, rather short. Limbs moderate; digits rather short, cylindrical in their basal, compressed in their distal portion, with enlarged plates beneath. Head covered with large subequal flat granules; rostral quadrangular, twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 10 upper and 7 lower labials; mental triangular; a pair of large chin-shields forming a suture behind the point of the mental, surrounded by much smaller chin-shields. Body covered above with uniform juxtaposed large squarish or hexagonal flat scales arranged regularly like the bricks of a wall. Abdominal scales smooth, round, imbricate, not half the size of the dorsals. No enlarged præanal or femoral scales or pores. Tail cylindrical, tapering, slightly swollen, covered with uniform, rather large smooth scales, which are imbricate beneath. Light yellowish brown above, with

large reddish-brown, black-edged spots arranged in pairs; two transverse spots on the nape, the posterior crescent-shaped; head with small darker spots and a streak from the eye to the ear; lips and side of throat with small brown dots and marblings; lower surfaces brownish white.

From snout to vent 2 inches.

Hab. Patinghe Hill, Jeypore, near Vizagapatam, 4200 feet; in woods.

59. Gymnodactylus deccanensis.

Gymnodactylus deccanensis, *Günth. Rept. B. I.* p. 115, pl. xii, fig. E; *Theob. Cat.* p. 81; *Bouleng. Cat. Liz.* i, p. 36.

Head rather large, oviform; snout longer than the diameter of the orbit or the distance between the eye and the ear-opening; forehead and loreal region concave; ear-opening suboval, vertical, about one third the diameter of the eye. Body moderately elongate, depressed. Limbs rather long; digits moderately elongate, cylindrical in the basal, compressed in the distal portion; the plates under the basal phalanx very small, little larger than the surrounding tubercles. Head covered with convex granules, largest on the snout and temples; rostral quadrangular, not quite twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 9 to 11 upper and as many lower labials; mental triangular or pentagonal; a pair of large chin-shields, forming a long suture behind the point of the mental, in contact externally and posteriorly with two smaller pairs. Body covered above with large juxtaposed subequal tubercles arranged in more or less regular transverse series; these tubercles flat or very slightly keeled, generally with a small raised point in the centre. Abdominal scales round, smooth, subimbricate, much smaller than dorsals. Males with enlarged præanal and femoral scales, but without pores. Tail cylindrical, tapering, covered with uniform smooth scales arranged in rings. Reddish brown above, with narrow white, black-edged cross bars; the first semicircular, extending from one eye to the other across the nape; a second on the scapular region, two on the body, and a fifth on the sacrum; similar bands forming annuli round the tail; lower surfaces whitish.

From snout to vent 2·5 inches; tail 2·25.

Hab. Deccan (Bombay Presidency); also Matheran near Bombay.

60. Gymnodactylus albofasciatus.

Gymnodactylus albofasciatus, *Bouleng. Cat. Liz.* i, p. 37, pl. iv, fig. 3.

This species resembles *G. deccanensis* strikingly in size, proportions, and colour, but is distinguished by the following characters:—The dorsal pholidosis is not composed of uniform large tubercles, but of intermixed smaller and larger tubercles, the latter being mostly feebly keeled; the small scales on the limbs and upper part

of the tail intermixed with larger keeled tubercles. The ventral scales are larger, tubercular, and feebly keeled. No chin-shields behind the median pair. The tubercular plates under the basal phalanx of all the digits much more developed. The ground-colour of the upper parts darker than in *G. deccanensis*, chestnut-brown.

Hab. South Canara; plains and up to 5000 feet.

61. Gymnodactylus oldhami.

Gymnodactylus oldhami, *Theob. Cat.* p. 81; *Bouleng. Cat. Liz.* i, p. 38.

Crown of head behind the eyes finely granular, the scales in front being larger; 11 upper and 10 lower labials; three pairs of chin-shields. Back granular, with about 30 longitudinal rows of tubercles contained within an area bounded by faint keels margining the belly. Enlarged præanal and femoral scales, but no pores. Colour above vinous brown; a white semicircular line joins the superciliary ridges; a second horseshoe-shaped white line runs from the gape below the ear to the opposite side, enclosing a nuchal collar; behind the collar two closely approximated white lines run along the spine, becoming soon broken into spots merely; on the sides are more white spots, tending to form three distinct lines, the lowest of which coincides with the ventral keel; belly whitish.

Hab. South Canara; unknown to me.

62. Gymnodactylus triedrus.

Gymnodactylus triedrus, *Günth. Rept. B. I.* p. 113; *Theob. Cat.* p. 85; *Bouleng. Cat. Liz.* i, p. 38.

Geckoella punctata, *Gray, P. Z. S.* 1867, p. 99, pl. ix; *Theob. Cat.* p. 96.

Head rather large, oviform; snout longer than the diameter of the eye, slightly longer than the distance between the eye and the ear-opening; forehead concave; ear-opening small, suboval, horizontal. Body and limbs moderate; digits short, cylindrical in their basal, compressed in their distal portion, with well-developed tubercle-like plates inferiorly. Head covered with small granules, largest on the snout; rostral quadrangular, not twice as broad as deep; nostril pierced between the rostral, the first labial, and several small scales; 10 or 11 upper and 9 lower labials; mental triangular; two or three pairs of chin-shields, median largest and forming a long suture behind the point of the mental. Upper surface of body covered with small granules intermixed with numerous small trihedral tubercles. Abdominal scales rather small, cycloid, imbricate, smooth. Males with 3 or 4 præanal pores. Tail cylindrical, tapering, rather swollen, covered with roundish smooth scales, which are small and subimbricate above,

much larger and strongly imbricate beneath. Brown above with small whitish spots; lower surfaces light brown.

From snout to vent 2·4 inches; tail 2·1.

Hab. Ceylon.

63. Gymnodactylus frenatus.

Gymnodactylus frenatus, *Günth. Rept. B. I.* p. 113, pl. xii, fig. D; *Theob. Cat.* p. 80; *Bouleng. Cat. Liz.* i, p. 42.

Head large, depressed, oviform; snout longer than the orbit, the diameter of which equals the distance from orbit to ear-opening; forehead concave; ear-opening suboval, oblique, nearly one third the diameter of the eye. Body and limbs rather elongate. Digits strong, distinctly depressed at the base, strongly compressed in the remaining portion; the basal phalanx with well-developed transverse plates beneath. Head granular, the granules largest on the snout; a few scattered round tubercles on the temples; rostral subquadrangular, twice as broad as deep, with median cleft above, and bordering on the nostril considerably; latter pierced between the rostral, the first labial, and three nasals; 10 to 12 upper and 9 or 10 lower labials; mental broadly triangular; a pair of chin-shields, forming a suture behind the mental; a few small chin-shields on each side of the median pair; gular scales minutely granular. Body covered above with flat granules intermixed with irregularly scattered small round smooth tubercles. A slight fold from axilla to groin. Abdominal scales rather small, cycloid, imbricate. Males with two pairs of præanal pores. Tail cylindrical, tapering, covered above with small flat subquadrangular scales, beneath with a median series of large transverse plates. Light pinkish brown above, with five pairs of angular dark-brown spots confluent into cross bands, the anterior, on the nape, uniting with a dark-brown band extending to the eye, and continued, more or less interruptedly, along the side of the body; tail with dark-brown annuli; lower surfaces whitish.

From snout to vent 3·2 inches; tail 4·3.

Hab. Ceylon.

64. Gymnodactylus khasiensis.

Pentadactylus? khasiensis, *Jerdon, P. A. S. B.* 1870, p. 75.
Gymnodactylus khasiensis, *Theob. Cat.* p. 84; *Bouleng. Cat. Liz.* i, p. 44.

Head large, much depressed, oviform; snout longer than the diameter of the orbit, which equals its distance from the ear-opening; forehead and loreal region concave; ear-opening suboval, about one third the diameter of the eye. Body and limbs rather elongate. Digits rather elongate, slightly depressed at the base, strongly compressed in the remaining portion; subdigital lamellæ well-developed, the distal one of the basal portion largest and nearly as long as broad. Head granular, the granules largest

on the snout; occiput and temples with scattered small round tubercles; rostral subquadrangular, not twice as broad as deep, with median cleft above; nostril pierced between the rostral and several small scales or granules; 10 to 12 upper and as many lower labials; mental triangular; one or two pairs of chin-shields, the largest forming a suture behind the point of the mental; throat minutely granulate. Body and limbs covered above with small granules intermixed with numerous small roundish, feebly keeled, subtrihedral tubercles; a slight fold from axilla to groin; ventral scales small (about 35 across the middle of the belly), cycloid, imbricate. Male without pubic groove or femoral pores, with a series of 10 to 13 præanal pores forming a very open angle. Tail cylindrical, tapering, covered above with small flat granules, with a few scattered slightly enlarged tubercles, below with small flat scales. Brown above, with darker angular spots, forming more or less regular series along the back; a dark streak on the side of the head, passing through the eye; tail with dark annuli; lower surfaces brownish.

From snout to vent 3 inches; tail 3·9.

Hab. Khási Hills, S. of Assam.

65. Gymnodactylus rubidus.

Puellula rubida, *Blyth, J. A. S. B.* xxix, 1860, p. 109; *Günth. Rept B. I.* p. 118.
Gecko tigris, *Tytler, J. A. S. B.* xxxiii, 1864, p. 546.
Cyrtodactylus rubidus, *Theob. Cat.* p. 93.
Gymnodactylus rubidus, *Bouleng. Cat. Liz.* i, p. 45.

Closely allied to the preceding, but the digits are shorter, and the subdigital lamellæ much smaller, considerably narrower than the digits. A longitudinal groove on the pubic region, containing a few præanal pores in the male.

Hab. Andaman Islands.

66. Gymnodactylus pulchellus.

Cyrtodactylus pulchellus, *Gray, Zool. Journ.* iii, 1828, p. 224; *id. Ill. Ind. Zool.* ii. pl. lxxiv.
Gymnodactylus pulchellus, *Günth. Rept. B. I.* p. 113; *Bouleng. Cat. Liz.* i, p. 46.

Head large, much depressed, oviform; snout longer than the orbit, the diameter of which equals its distance from the ear-opening; forehead and loreal region concave; ear-opening suboval, vertical, slightly oblique, one third to two fifths the diameter of the eye. Body and limbs rather elongate. Digits strong, slightly depressed at the base, strongly compressed in the remaining portion; the basal phalanx with well-developed transverse plates beneath. Head granular, with small round tubercles on the occipital and temporal regions, the granules enlarged on the snout, except in the frontal and loreal concavities. Rostral subquadrangular, nearly

twice as broad as deep, with median cleft above, and entering the nostril to a considerable extent; the latter directed backward, pierced between the rostral, the first labial, and three or four nasals; 10 to 13 upper and 10 to 12 lower labials; mental triangular; two or three pairs of chin-shields, median largest and in contact behind the point of the mental; throat minutely granulate. Body and limbs above with small flat granules intermixed with small roundish, keeled, subtrihedral tubercles; a series of keeled tubercles from axilla to groin, limiting the abdominal region; ventral scales cycloid, imbricate, moderately large. Males with a longitudinal groove on the pubic region containing two parallel series of præanal pores, forming a right angle with a long series of femoral pores; altogether 18 to 20 pores on each side, 4 or 5 of which are in the groove. Tail cylindrical, tapering, above with small flat scales and annuli of feebly keeled tubercles, beneath with a series of large transverse plates. Light brown above, with broad chestnut-brown, light-edged cross bands, which are narrower than the interspaces between them; the anterior horseshoe-shaped, from eye to eye over the nape; the second crescent-shaped, on scapular region; three others on the body; tail with chestnut-brown complete annuli; lower surfaces dirty white.

From snout to vent 4 inches; tail 5.

Hab. Malay Peninsula; said to occur also in Bengal.

67. Gymnodactylus variegatus.

Naultinus variegatus, *Blyth, J. A. S. B.* xxviii, 1859, p. 279.
Gymnodactylus variegatus, *Günth. Rept. B. I.* p. 116; *Theob. Cat.* p. 92; *Bouleng. Cat. Liz.* i, p. 43.

Limbs and digits slender; the basal joints not very distinct from the distal ones, which are strongly compressed, and provided with transverse imbricate plates below and a series of much smaller ones on the compressed phalanges. Rostral notched behind and grooved; nostril between the rostral, the first labial, and three nasals; 10 or 11 upper and 11 lower labials; mental partially wedged in between two large chin-shields, which form a broad suture with each other. Body granular, with numerous large trihedral tubercles. 26 longitudinal rows of rather elongate leaf-like scales on the middle of the belly. A fold of skin along the side, indicating where the abdominal scales terminate and the granules begin. 16 femoral pores on each side along the whole length of the thigh. Tail cylindrical, the granules arranged in verticils, and the tubercles in rings; a series of enlarged subcaudals. Grey above, spotted and marbled with black, set off with subdued white; a broad dark streak bordered with whitish behind each eye, and continued irregularly round the occiput; tail irregularly banded above; lower parts whitish.

Total length about 6 inches, the tail measuring nearly half that length.

Hab. Moulmein.

Both this and the following species are unknown to me.

68. Gymnodactylus fasciolatus.

Naultinus fasciolatus, *Blyth, J. A. S. B.* xxix, 1860, p. 114.
Gymnodactylus fasciolatus, *Günth. Rept. B. I.* p. 116; *Theob. Cat.* p. 92; *Bouleng. Cat. Liz.* i, p. 44.

Differs from *G. variegatus* in the smaller ventral scales, which form 36 longitudinal series in the middle of the belly, and in the small number of præanal pores, viz., 5 or 6 on each side, extending outwards in a line with the commencement of the thigh. A dark-brown band, edged behind with white, from the eye to the occiput, where it meets its fellow of the opposite side; a brown similarly white-edged band on the nape, with seven cross bands on the body; tail cross-barred.

Hab. Subáthu, near Simla, Western Himalayas.

Genus AGAMURA,

Blanford, A. M. N. H. (4) xiii, 1874, p. 455.

Digits slender, clawed, cylindrical at the base; the distal phalanges compressed, forming an angle with the basal portion of the digits; the claw between two enlarged scales; digits beneath with a row of plates. Body covered with small granules intermixed with enlarged tubercles. Tail very slender, not fragile. Pupil vertical. Males with or without præanal pores.

Distribution. Persia, Afghanistan, and Baluchistan. Two species are known, one of which inhabits Baluchistan.

69. Agamura cruralis.

Agamura cruralis, *Blanf. A. M. N. H.* (4) xiii, 1874, p. 455; *id. Eastern Persia,* ii, p. 356, pl. xxiii, fig. 3; *Bouleng. Cat. Liz.* i p. 50.

Fig. 23.—*Agamura cruralis.*

Head short, feebly depressed; snout as long as, or slightly longer

than, the diameter of the orbit, or the distance between the eye and the ear-opening; eye large; forehead not concave; ear-opening subelliptical, vertical, one third or two fifths the diameter of the eye. Body feebly depressed, rather short. Limbs very long and slender; the hind limb if carried forward reaches the eye; the fore limb being stretched forward, the wrist attains the tip of the snout or slightly beyond; digits long and slender, unequal. Head covered with flat granules, largest on the snout; rostral broader than deep, with median cleft above; nostril pierced between the rostral, the first labial, and three rather swollen nasals; 13 or 14 upper and 10 or 11 lower labials; mental elongately trapezoidal, twice as long as broad; no chin-shields. Body covered above with small, rather irregular, flat granules, intermixed with rather numerous scattered round flat tubercles. Ventral scales small, roundish-hexagonal, juxtaposed or subimbricate, smooth. Male with two præanal pores. Tail very thin and rounded, of nearly the same thickness to the end, covered above with smooth imbricate elongate squarish scales, beneath with a row of larger plates. Greyish brown or sandy above, more or less dotted with darker, especially on the sides of the head and neck; usually a dark cross band on the back of the neck and four or five others on the back. Lower surfaces white; throat more or less brown-dotted.

From snout to vent 2·5 inches; tail 2·7.

Hab. Baluchistan; in barren stony plains up to 3000 feet.

Genus **PRISTURUS**,

Rüppell, N. Wirbelth. Abyss., Rept. p. 16, 1835.

Digits slender, clawed, cylindrical at the base; the distal phalanges compressed, forming an angle with the basal portion of the digits, the lower surface of which has a row of plates. Body not depressed, covered with uniform granules. Tail compressed, keeled. Pupil circular; eyelid distinct all round the eye. No præanal or femoral pores.

A genus of diurnal Geckos, comprising 6 species, inhabiting the shores and Islands of the Red Sea and the Persian Gulf. The following species has recently been added to the fauna of Sind by J. A. Murray.

70. **Pristurus rupestris.**

Pristurus rupestris, *Blanford, A. M. N. H.* (4) xiii, 1874, p. 454; *id. Eastern Persia*, ii, p. 350, pl. xxiii, fig. 1; *Murray, Zool. Sind*, p. 365, pl. —, fig. 1; *Bouleng. Cat. Liz.* p. 53.

Head short and high; snout acuminate, $1\frac{2}{5}$ to $1\frac{1}{2}$ diameter of orbit; forehead scarcely concave; ear-opening oval, oblique, about one third the diameter of the orbit. Limbs long, the hind limb when stretched forwards reaching the ear-opening or between the shoulder and the ear-opening; digits long and slender. Snout

covered with polygonal convex scales; the remainder of the head, the body, and the limbs covered with small granules; those on the belly larger, though smaller than the scales on the snout. Rostral more than twice as broad as deep, with median cleft above; nostril pierced between the rostral and two or three nasals; 7 or 8 upper and 5 or 6 lower labials; mental very large, truncate posteriorly; no regular chin-shields. Tail longer than head and body, slender, strongly compressed, keeled above and beneath; the two keels denticulate, the upper most strongly, especially in males, in which it forms a regular crest, which, however, never extends to the body. Grey-brown or olive above, clouded with darker, and frequently with round lighter spots; a dark streak passing through the eye; small bright red dots may be present on the sides of the body; sometimes a light reddish vertebral band.

From snout to vent 1·25 inches; tail 2·1.

Hab. Sind (Karáchi), according to Murray; also islands in Persian Gulf, Muscat, and Socotra.

Genus **GONATODES**,

Fitzing. Syst. Rept. p. 91, 1843.

Digits slender, clawed, cylindrical or depressed at the base (in one species dilated); the distal phalanges compressed, forming an angle with the basal portion of the digits, the lower surface of which has a row of plates. Body more or less depressed, granular or tubercular above. Tail not compressed. Pupil circular; eyelid distinct all round the eye. Males with or without præanal or femoral pores.

Of the 18 species of this genus, 6 occur in Tropical America, 2 in the Malay subregion, the rest in India and Ceylon. Diurnal.

Synopsis of Indian and Ceylonese Species.

A. Digits not dilated.
- *a.* Flanks without spine-like projecting tubercles.
  - *a′.* Males with femoral pores, without præanal pores.
    - *a″.* Back with uniform keeled granules; 4 or 5 pores on each side .... *G. indicus*, p. 74.
    - *b″.* Back with uniform or heterogenous round granules, each with a raised central point or short keel; 4 to 6 pores on each side .... *G. wynadensis*, p. 75.
    - *c″.* Back with uniform round granules; 8 pores on each side .... *G. sisparensis*, p. 75.
  - *b′.* Males without femoral pores, with præanal pores.
    - *a″.* Back with small smooth granules irregularly intermixed with small smooth or slightly keeled tubercles; ventral scales smooth; 6 to 9 pores. *G. ornatus*, p. 75.

b''. Back with small granules irregularly intermixed with slightly larger ones, all with a central raised point or short keel; ventral scales keeled; 6 to 8 pores .... *G. marmoratus*, p. 76.

c'. Males with præanal and femoral pores.

a''. Back with small strongly keeled tubercles, and scattered enlarged ones on the flanks; 2 or 3 præanal, and on each side 3 or 4 femoral pores. *G. mysoriensis*, p. 77.

b. Flanks with small spine-like projecting tubercles.

a''. Scales under the neck keeled; tail with rings of spine-like tubercles; 3 or 4 præanal, and on each side 3 to 5 femoral pores .... *G. kandianus*, p. 77.

b''. Scales under the neck smooth; tail with rings of spine-like tubercles; 2 to 4 præanal, and on each side 3 to 5 femoral pores .... *G. gracilis*, p. 78.

c''. No enlarged tubercles on the back; no rings of spines on the tail; no præanal pores; 5 to 12 femoral pores on each side .... *G. jerdonii*, p. 78.

B. Digits dilated at the base, with large plates beneath .... *G. littoralis*, p. 79.

71. Gonatodes indicus.

Goniodactylus indicus, *Gray, A. M. N. H.* xviii, 1846, p. 429.
Gymnodactylus indicus, *Günth. Rept. B. I.* p. 115; *Theob. Cat.* p. 85.
Gonatodes indicus, *Bouleng. Cat. Liz.* i, p. 64, pl. vi, fig. 1.

Head short; snout obtusely pointed, slightly longer than the distance between the eye and the ear-opening, $1\frac{2}{3}$ diameter of orbit; forehead not concave; ear-opening very small, round. Body and limbs moderate; the hind limb scarcely reaching the axilla. Digits moderately slender; the basal joint not dilated, scarcely wider than the distal joints, with larger subequal plates beneath. Upper surfaces covered with uniform strongly keeled granules, which are larger on the back than on the snout. Rostral subquadrangular, twice as broad as deep, with median cleft above; nostril pierced between the rostral and three nasals; 7 or 8 upper and 5 or 6 lower labials; mental large, broad, subtriangular or pentagonal, with truncated posterior angle; small chin-shields passing gradually into the gular granules. Ventral scales hexagonal, imbricate, smooth or feebly keeled. Males with 4 or 5 femoral pores on each side. Tail cylindrical, tapering, covered above with uniform small keeled scales, below with larger scales, those of the median series being slightly enlarged. Brown above, marbled with darker and lighter; sometimes a light vertebral line; brownish white beneath, the throat frequently brown, or brown-marbled.

From snout to vent 1·6 inches; tail 1·8.

Hab. Nilgiris.

72. Gonatodes wynadensis.

Gymnodactylus wynaadensis, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 87.
Gonatodes wynadensis, *Bouleng. Cat. Liz.* i, p. 65, pl. vi, fig. 2.

Habit of *G. indicus*. The basal part of the digits beneath with very small scales, the two distal scales only being a little enlarged and plate-like. Head covered with very small granules, which are keeled on the snout. Upper surface of body with large round granules, each with a raised central point or short keel, largest on the sides; these tubercles are either homogeneous or intermixed with much smaller ones, and as there occur specimens which are intermediate in this respect, no great importance can be attached to this difference. Abdominal scales smooth. 6 upper and 7 or 8 lower labials. Male with 4 or 5 femoral pores on each side. Tail generally with a median series of transversely dilated plates below. Brown above, marbled with darker and lighter; the median dorsal line sometimes lighter, dark-bordered; below brownish, the throat brown-marbled; tail beneath dark brown, usually lighter spotted.

From snout to vent 1·6 inches; tail 1·8.

Hab. Wynaad and hill-ranges further south, in moist forests.

73. Gonatodes sisparensis.

Gymnodactylus maculatus (*non Steind.*), *Beddome, Madras Journ. Med. Sc.* 1870.
Gymnodactylus sisparensis, *Theob. Cat.* p. 86.
Gonatodes sisparensis, *Bouleng. Cat. Liz.* i, p. 66.

Closely allied to *G. wynadensis*, but the digits much more elongate. 8 femoral pores on each side. Dorsal tubercles homogeneous. Brown, with regular transverse dark bands across the body and tail.

From snout to vent 2·4 inches.

Hab. Sispára Ghat, Nilgiri hills.

74. Gonatodes ornatus.

Gymnodactylus ornatus, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 88.
Gonatodes ornatus, *Bouleng. Cat. Liz.* i, p. 66, pl. vi, fig. 3.

Head rather elongate; snout acuminate, longer than the distance between the eye and the ear-opening, $1\frac{1}{2}$ to $1\frac{2}{3}$ diameter of orbit; forehead feebly concave; ear-opening small, vertically oval. Body moderate, limbs rather slender; the hind limb reaching the shoulder or a little beyond. Digits elongate, slender; the basal part not dilated, scarcely wider than the distal, beneath with very small plates and a large discoid one under the articulation. Snout covered with keeled granules; hinder part of head with uniform minute granules. Rostral four-sided, twice as broad as deep, with median

cleft above; nostril pierced between the rostral and three nasals; 6 to 9 upper and 7 or 8 lower labials; mental large, triangular or pentagonal, its posterior angle truncated and in contact with a small median chin-shield; two pairs of larger chin-shields. Upper surface of body covered with small smooth granules, irregularly intermixed with small round convex, sometimes slightly keeled, tubercles. Abdominal scales small, round, imbricate, smooth. Males with 6 to 9 præanal pores forming an angular line. Tail cylindrical, slender in its distal half, covered above with small smooth scales, in its anterior portion with semiannuli of pointed keeled tubercles; inferiorly with large smooth scales, the median series being a little enlarged. Brown above, with blackish and whitish markings; head usually with black and white angular lines; generally a black and white band across the neck and a white black-edged ocellus in front of the arm; tail with complete black and white annuli; lower surface brownish, the lower lip brown-edged.

From snout to vent 2·15 inches; tail 2·4.

Hab. Tinnevelly and Travancore; under rocks, in dry jungles.

75. Gonatodes marmoratus.

Gymnodactylus marmoratus (*non D. & B.*), *Beddome, Madras Journ. Med. Sc.* 1870.

Gymnodactylus beddomei, *Theob. Cat.* p. 88.

Gonatodes marmoratus, *Bouleng. Cat. Liz.* i, p. 67, pl. vi, fig. 4.

Head rather elongate; snout acuminate, longer than the distance between the eye and the ear-opening, $1\frac{1}{2}$ to $1\frac{2}{3}$ the diameter of orbit; forehead feebly concave; ear-opening small, vertically oval. Body moderate, limbs rather slender; the hind limb reaching the shoulder or a little beyond. Digits elongate, slender; the basal part not dilated, scarcely wider than the distal, beneath with regular plates, that under the articulation being large and discoid. Head covered with small granules, largest and keeled on the snout. Rostral four-sided, twice as broad as deep, with median cleft above; nostril pierced between the rostral and three nasals; 6 to 8 upper and as many lower labials; mental large, triangular or pentagonal, its posterior angle truncated; chin-shields very small. Upper surface of body covered with small granules, irregularly intermixed with slightly larger ones; all these tubercles with a central raised point or a short keel. Abdominal scales very small, juxtaposed, convex, keeled. Males with 6 to 8 præanal pores. Tail cylindrical, tapering, covered above with uniform, small, feebly keeled scales, below with larger smooth scales, those of the median series sometimes a little enlarged. Brown above, clouded with darker and lighter markings; tail with ill-defined darker and lighter annuli; the lower lip edged with dark brown; another dark brown streak, parallel to the latter, on each side of the throat.

From snout to vent 2 inches; tail 1·9.

Hab. Travancore, Wynaad, Tinnevelly, 3000 to 5000 feet.

76. Gonatodes mysoriensis.

Gymnodactylus mysoriensis, *Jerdon, J. A. S. B.* xxii, 1853, p. 469; *Günth. Rept. B. I.* p. 114; *Theob. Cat.* p. 90.
Gonatodes mysoriensis, *Bouleng. Cat. Liz.* i, p. 68.

Head short; snout obtusely pointed, longer than the distance between the eye and the ear-opening, 1½ the diameter of the orbit; forehead not concave; ear-opening very small, oval. Body and limbs moderate; the hind limb not reaching beyond the axilla. Digits slender but rather short, the basal part not dilated, and with small plates beneath. Upper surface covered with small strongly keeled tubercles, smallest on the hinder part of the head, largest on the sides of the body, where they are intermixed with irregularly scattered tubercles, differing only in size from the granules of the back. Rostral quadrangular, nearly twice as broad as deep, with median cleft and emargination above; nostril pierced between the rostral and three nasals; 6 or 7 upper and 7 or 8 lower labials; mental large, broadly triangular, its posterior angle truncated; small chin-shields passing gradually into the rather large, flat, gular granules. Abdominal scales moderate, hexagonal, imbricate, smooth. Males with 2 or 3 præanal, and on each side 3 or 4 femoral pores. Tail cylindrical, tapering, covered above with small keeled scales and large pointed keeled tubercles in six longitudinal series, below with larger smooth scales, those of the median series slightly enlarged. Brown above, frequently with a light vertebral band and a series of dark brown marks on the back; digits very conspicuously dark-barred; lower surface whitish, throat sometimes brown-marbled.

From snout to vent 1 inch; tail 1·5.

Hab. Mysore and Shervaroy hills.

77. Gonatodes kandianus.

Gymnodactylus kandianus, *Kelaart, Prodr.* p. 186; *Günth. Rept. B. I.* p. 114; *Theob. Cat.* p. 86.
? Gymnodactylus wicksii, *Stoliczka, J. A. S. B.* xlii, 1873, pt. 2, p. 165; *Theob. Cat.* p. 91.
? Gymnodactylus humei, *Theob. Cat.* p. 89.
Gonatodes kandianus, *Bouleng. Cat. Liz.* i, p. 68.

Head rather elongate; snout obtusely pointed, longer than the distance between the eye and the ear-opening, 1½ the diameter of the orbit; forehead not concave; ear-opening small, oval. Body and limbs rather slender; the hind limb reaching the axilla or the shoulder. Digits slender, the basal part not dilated, scarcely wider than the distal, and with enlarged plates beneath. Snout covered with suboval keeled granules; the rest of the head minutely granulate; rostral twice as broad as deep, with median emargination and cleft above; nostril pierced between the rostral and three or four nasals; 7 or 8 upper and as many

lower labials; mental large, triangular, with truncated posterior angle; numerous small chin-shields passing gradually into the gular granules, which are feebly keeled. Upper surface of body covered with small, more or less distinctly keeled granules, intermixed with irregularly scattered small keeled tubercles; flanks with small, widely separated, spine-like tubercles. Scales on the limbs keeled. Ventral scales cycloid, imbricate, those under the neck keeled, the others smooth (or keeled in the var. *tropidogaster*). Males with 3 or 4 præanal, and on each side 3 to 5 femoral pores. Tail cylindrical, tapering, above with very small keeled scales and annuli of spine-like tubercles, beneath with larger scales, but no transversely dilated median plates. Brown above, variegated with darker and lighter, these variegations generally forming transverse markings on the back and tail; sometimes a light vertebral band; the spine-like tubercles on the flanks white; lower surfaces light brown or dirty white, the throat sometimes blackish.

From snout to vent 1·4 inches; tail 1·5.

Hab. Ceylon, Southern India; abundant in houses in Kandy. *G. wicksii* is from Preparis Island.

78. Gonatodes gracilis.

? Gymnodactylus malabaricus, *Jerdon, J. A. S. B.* xxii, 1853, p. 469; *Theob. Cat.* p. 90.
Gymnodactylus gracilis, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 87.
Gonatodes gracilis, *Bouleng. Cat. Liz.* i, p. 70, pl. vi, fig. 5.

Closely allied to *G. kandianus*, from which it differs in the following points:—The gular granules are larger, flat, smooth; so are also the ventral scales; the mental is very seldom truncated posteriorly, and the median chin-shields form a suture behind its point. Males with 2 or 4 præanal, and on each side 3 to 5 femoral pores. Grey-brown above, with darker and lighter spots; usually a median row of light blotchés on the centre of the back; temples and sides of neck and throat with oblique dark brown lines; tail with blackish semiannuli; digits conspicuously blackish-barred; lower surfaces whitish.

From snout to vent 1·25 inches; tail 1·7.

Hab. Southern India, Ceylon; in forests.

79. Gonatodes jerdonii.

Gymnodactylus jerdonii, *Theobald, Cat. Rept. As. Soc. Mus.* p. 31; *id. Cat.* p. 89.
Gonatodes jerdonii, *Bouleng. Cat. Liz.* i, p. 71.

In habit similar to *G. kandianus* and *gracilis*. Digits not dilated, but with rather large plates under the basal part, the most distal of these plates being the largest and longitudinally oval in

shape. Upper surface covered with uniform small granules, smooth on the back, a little larger and keeled on the snout; a few erect spine-like tubercles on the flanks. Rostral four-sided, nearly twice as broad as deep, with median cleft above; nostril pierced between the rostral and three nasals; 8 to 10 upper and 7 or 8 lower labials; mental large, triangular or pentagonal; small chin-shields passing gradually into the granules of the throat, which are rather large, flat and smooth. Ventral scales hexagonal, imbricate, smooth. Male with 5 to 12 femoral pores on each side; no præanal pores. Tail cylindrical, tapering, covered with small smooth scales, in its basal half with a few scattered larger tubercles; median series of subcaudals enlarged. Grey-brown above, clouded with darker; the small lateral spines white; sometimes a black cervical spot; whitish beneath, the throat sometimes brown-dotted.

From snout to vent 1·65 inches.

Hab. Ceylon, Southern India (Lamparis Peak, 5000 feet).

80. Gonatodes littoralis.

Gymnodactylus littoralis, *Jerdon, J. A. S. B.* xxii, 1853, p. 469; *Theob. Cat.* p. 90.

Gymnodactylus planipes, *Beddome, Madras Journ. Med. Sc.* 1870 *Theob. Cat.* p. 87.

Gonatodes littoralis, *Bouleng. Cat. Liz.* i, p. 71, pl. vi, fig. 6.

Habit very slender. Head long; snout pointed, much longer than the distance between the eye and the ear-opening, $1\frac{2}{3}$ to $1\frac{3}{4}$ diameter of orbit; forehead very slightly concave; ear-opening small, oval, vertical. The hind limb does not reach beyond axilla. Digits strongly dilated at the base, with large plates beneath; the distal plate is the largest, longer than broad, truncated anteriorly. Upper surface covered with equal smooth granules, minute on the back, much larger on the snout; a few very small subconical tubercles are scattered on the flanks. Rostral large, quadrangular, twice as broad as deep, with median cleft above; nostril pierced between the rostral and three nasals; 8 to 10 upper and 6 to 8 lower labials; mental large, broadly triangular, its posterior angle truncated; small chin-shields passing gradually into the small smooth gular granules. Ventral scales hexagonal, imbricate, smooth. Males with 16 to 18 femoral pores on each side; no præanal pores. Tail cylindrical, tapering, above with uniform small smooth scales, beneath with a median series of transversely dilated plates. Grey-brown above, generally with a row of lighter dark-edged spots along the back, and a black spot on the nape; nearly always a black line bordering the lower lip, and extending as far as the ear; lower surfaces whitish.

From snout to vent 1·35 inches; tail 1·4.

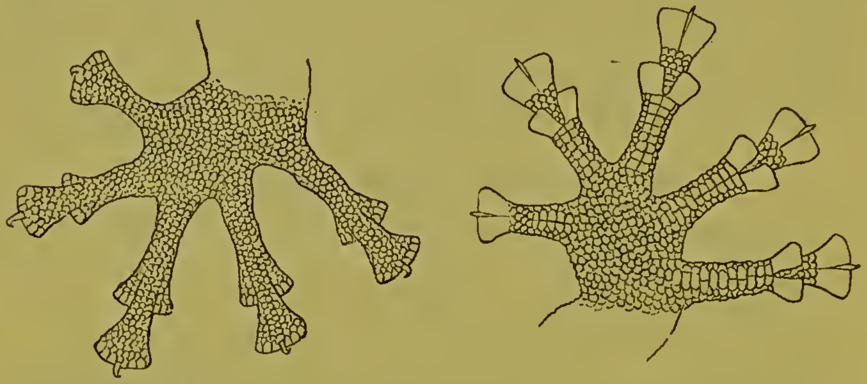
Hab. Malabar; Nilambúr and Nellakota, on the west side of the Nilgiris; found on trees in dry teak-forests. Jerdon's type specimen was obtained in a warehouse on the sea-coast.

Genus CALODACTYLUS,

Beddome, Madras Journ. Med. Sc. 1870, p. 30.

Digits slender at the base, free, with squarish scales beneath, with large trapezoidal penultimate and distal expansions, the lower surface of each of which is covered by two large plates separated by a longitudinal groove; all the digits clawed, the claw retractile between the distal plates; in the inner digit the penultimate expansion is absent. Body covered above with small granular scales, intermixed with larger tubercles; abdominal scales juxtaposed. Pupil vertical. No præanal or femoral pores.

Southern India.



a *b*

Fig. 24.—Foot of *Calodactylus aureus*: *a*, upper; *b*, lower surface.

81. Calodactylus aureus.

Calodactylus aureus, *Bedd. Madras Journ. Med. Sc.* 1870, p. 30, pl. ii.; *Theob. Cat.* p. 74; *Bouleng. Cat. Liz.* i, p. 108.

Head large, oviform, very distinct from neck; a strong rounded supraorbital and canthal ridge; five deep concavities, viz. a frontal, two postnasals, and two loreals; snout longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ the diameter of the orbit; ear-opening vertical, measuring half the diameter of the eye. Body not much depressed. Limbs long, slender. The width of the digital expansion measures about half the diameter of the eye. Head covered with very small granules, largest on the canthal ridges; rostral four-sided, twice as broad as high, its posterior border concave; nostril pierced between the rostral, the first labial, and three nasals, the anterior large and in contact with its fellow; 12 or 13 upper and as many lower labials; mental as large as the adjacent labials, or smaller than them; no regular chin-shields, but small polygonal scales passing gradually into the granules which cover the gular region. Upper surface covered with minute granules; back with scattered, scarcely prominent, smooth, round, larger tubercles, hardly as large as the ventral scales; the latter flat, smooth, squarish, juxtaposed,

arranged like the bricks of a wall. Tail long, cylindrical, remarkably slender, covered with squarish scales which are much larger beneath. Brownish white above (golden during life), dotted or vermiculated with brown; lower surfaces whitish.

From snout to vent 3·5 inches; tail 3·2.

Hab. Amongst rocks in dark shady ravines on the Tirupati Hills in North Arcot.

Genus **PTYODACTYLUS**,

Gray, Ann. Phil. (2) x. 1825, p. 198.

Digits slender, free, with a series of transverse plates below, the extremity strongly dilated, with two diverging series of lamellæ beneath; every digit armed with a claw retractile in the anterior notch of the distal expansion. Body covered above with small granular scales, uniform or intermixed with enlarged tubercles; abdominal scales scarcely imbricate. Pupil vertical. No præanal or femoral pores.

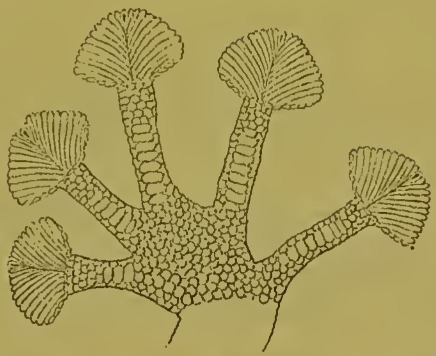


Fig. 25.—Foot of *Ptyodactylus homolepis*, lower surface.

Of the two species of this genus, one inhabits the arid districts of North Africa, Arabia, and Syria, the other Sind.

82. **Ptyodactylus homolepis.**

Ptyodactylus homolepis, *Blanford, J. A. S. B.* xlv, 1876, pt. 2, p. 19, pl. ii; *Murray, Zool. Sind,* p. 358; *Bouleng. Cat. Liz.* i, p. 111.

Head large, very distinct from neck; snout slightly longer than the distance between the eye and the ear-opening; forehead concave; ear-opening vertical, subcrescentic. Limbs long and thin. Upper parts covered with small uniform granules, smallest on the back of the head and neck. Nostril pierced between three scales, forming a swelling; rostral six-sided; 14 or 15 upper and as many lower labials; mental small; a row of small chin-shields. Ventral scales small, smooth; larger scales on the pubic region. Tail cylindrical, tapering, covered above with uniform small granules, beneath with larger flat scales. Light brownish grey above, with broad transverse wavy bands of lighter and darker shades; white beneath.

From snout to vent 4 inches; tail 3·4.

Hab. Sind (Khirthar range, Shikárpur district).

Genus HEMIDACTYLUS,

Gray, Ann. Phil. (2) x. 1825, p. 199.

Digits free or more or less webbed, dilated, beneath with two rows of lamellæ; all the digits provided with slender distal clawed joints angularly bent and rising from within the extremity of the

a b

Fig. 26.—Foot of *Hemidactylus coctæi*.
a. Upper surface. *b*. Lower surface.

dilated portion. Dorsal lepidosis uniform or heterogeneous. Pupil vertical. Males with præanal or femoral pores.

Distribution. Southern Europe; Southern Asia; Africa; Tropical America; Polynesia. 30 species are known.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Slender compressed joint of inner digit very short, not half as long as dilated basal portion; 4 to 6 lamellæ under inner, and 7 to 10 under median toe*.
- *a*. Dorsal granules intermixed with numerous small, roundish, keeled tubercles . . *H. reticulatus*, p. 84.
- *b*. Dorsal granules intermixed with longitudinally oval or elliptical, strongly keeled tubercles . . . . *H. gracilis*, p. 84.
- *c*. Dorsal granules uniform, or with scattered small, round, convex tubercles . . . . *H. frenatus*, p. 85.

B. Slender compressed joint of inner digit at least half as long as dilated portion.
- *a*. Enlarged dorsal tubercles strongly keeled.

* The infradigital lamellæ are counted longitudinally, those which are divided on the median line being reckoned as one. See fig. 26, above, which represents a foot with 8 lamellæ under the inner, and 11 under the median toe.

a'. Lamellæ not exceeding 8 under inner and 11 under median toe.
a''. Digits free.
α. 4 to 6 lamellæ under inner, and 7 or 8 under median toe; dorsal tubercles in 16 to 20 longitudinal series; male with 8 to 12 femoro-præanal pores on each side .... *H. gleadovii*, p. 86.
β. 6 to 8 lamellæ under inner, and 9 to 11 under median toe; tubercles in 14 or 16 longitudinal series; male with 2 to 5 præanal pores on each side .... *H. turcicus*, p. 87.
γ. 6 or 7 lamellæ under the inner, and 8 to 10 under the median toe; tubercles in 16 to 20 longitudinal series; male with 6 to 8 pores on each side. *H. triedrus*, p. 89.
b''. Digits webbed at base; tail depressed, flat below, with sharp denticulated lateral edge .... *H. depressus*, p. 90.
b'. Lamellæ more than 8 under inner, and more than 11 under median toe.
a''. Infradigital lamellæ obliquely curved; dorsal tubercles in 14 to 16 longitudinal series; male with a few (8) præanal pores .... *H. persicus*, p. 88.
b''. Infradigital lamellæ straight, transverse; dorsal tubercles in about 20 longitudinal series; male with 19 to 25 femoral pores on each side .... *H. maculatus*, p. 88.
c''. Infradigital lamellæ slightly oblique; dorsal tubercles in 18 or 20 longitudinal series .... *H. subtriedrus*, p. 90.
b. Enlarged dorsal tubercles, if present, small, smooth, conical, or very feebly keeled.
a'. Digits free or very slightly webbed at base.
a''. Tail with enlarged tubercles above.
α. 9 to 11 lamellæ under median toe, and 6 or 7 under inner; male with 12 to 16 femoral pores on each side .... *H. leschenaultii*, p. 91.
β. 11 to 13 lamellæ under median toe, and 8 to 10 under inner; male with 5 or 6 femoral pores on each side . . *H. coctæi*, p. 92.
b''. Tail transversely oval or ellliptical in section, with uniform small scales above.
α. Infradigital lamellæ straight, transverse, 11 or 12 under the inner, and 13 to 15 under the median toe .... *H. giganteus*, p. 92.
β. Infradigital lamellæ obliquely curved, 5 to 7 under the inner, and 9 or 10 under the median toe .... *H. bowringii*, p. 93.
c''. Tail flat beneath, with sharpish, denticulated lateral edge, covered above with uniform small scales.

a. Back with numerous small convex tubercles .... *H. karenorum*, p. 93.
β. Back uniformly granular .... *H. garnoti*, p. 94.
b'. Digits nearly half-webbed; a much developed cutaneous expansion from axilla to groin .... *H. platyurus*, p. 95.

83. Hemidactylus reticulatus.

Hemidactylus reticulatus, *Beddome, Madr. Journ. Med. Sc.* 1870; *Bouleng. Cat. Liz.* i, p. 118, pl. xi, fig. 2.

Head short, oviform, very convex; snout a little longer than the distance between the eye and the ear-opening and than the diameter of the orbit; forehead not concave; ear-opening small, roundish. Body and limbs short. Digits short, free, with very short distal joints, moderately dilated; 5 or 6 lamellæ under the inner digits, 7 or 8 under the fourth finger, and 8 or 9 under the fourth toe. Snout covered with keeled granules; the rest of the head with smaller granules intermixed with round tubercles. Rostral four-sided, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three or four nasals; 9 or 10 upper and 7 to 9 lower labials; mental large, triangular or pentagonal; four chin-shields, inner pair largest and in contact behind the point of the mental. Body covered above with coarse granules intermixed with numerous irregularly arranged, small, round, keeled tubercles. Abdominal scales rather small, cycloid, imbricate, smooth. Male with 6 to 9 præanal pores forming an angular series. Tail cylindrical, tapering, covered above with small granular scales and rings of six or eight large conical tubercles, beneath with uniform small imbricated scales. Brown above, with a network of darker lines; many of the tubercles whitish; lower surfaces whitish, the throat sometimes vermiculated with brown.

From snout to vent 1·55 inches.

Hab. Southern India (Colegal, Shevaroys).

84. Hemidactylus gracilis.

Hemidactylus gracilis, *Blanford, J. A. S. B.* xxxix, 1870, pt. 2, p. 362, pl. xvi, figs. 4–6; *Theob. Cat.* p. 76; *Bouleng. Cat. Liz.* i, p. 119.

Head narrow, elongate; snout a little longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ or $1\frac{2}{5}$ the diameter of the orbit; forehead not concave; ear-opening small, roundish. Body and limbs slender, feebly depressed. Digits free, very feebly dilated, inner well developed; the distal joint short; 5 lamellæ under the inner digit, 7 under the fourth finger, and 9 under the fourth toe. Snout with rather large polygonal rugose scales; hinder part of head with small granules. Rostral four-sided, not twice as broad as deep, with median cleft above; nostril pierced

between the rostral and four nasals; 9 upper and 7 lower labials; mental large, triangular, more than twice as long as the adjacent labials; four large chin-shields, inner pair in contact behind the point of the mental. Body covered above with coarse granules intermixed with oval, subtrihedral, strongly keeled tubercles arranged in about twelve irregular longitudinal series. Abdominal scales large, cycloid, imbricate, smooth. Male with 6 præanal pores forming an angular series. Tail round, but slightly depressed at the base and not at all further back, tapering, without any enlarged or spinose tubercles whatever. Grey above, with subquadrangular black spots arranged in longitudinal series, confluent into lines on the rachis and sides; a black streak white-edged above on the side of the head, passing through the eye; whitish beneath, with or without longitudinal grey lines.

From snout to vent 1·4 inches.

Hab. South-east Berar and Raipur, Central Provinces.

85. Hemidactylus frenatus.

Hemidactylus frenatus, *Dum. & Bibr. Erp. Gén.* iii, p. 366; *Kelaart, Prodr.* p. 161; *Günth. Rept. B. I.* p. 108; *Theob. Cat.* p. 78; *Bouleng. Cat. Liz.* i, p. 120.
? Hemidactylus punctatus, *Jerdon, J. A. S. B.* xxii, 1853, p. 467.
Gecko chaus *et* caracal, *Tytler, J. A. S. B.* xxxiii, 1864, p. 547.

Snout longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ to $1\frac{1}{2}$ the diameter of the orbit; forehead concave; ear-opening small, roundish. Body and limbs moderate. Digits moderately dilated, free, inner with sessile claw; 4 or 5 lamellæ under the inner digits, 7 or 8 (seldom 9) under the fourth finger, and 9 or 10 under the fourth toe. Upper surfaces covered with small granules, largest on the snout; on the back these granules are intermixed with more or less numerous irregularly scattered round convex tubercles always much smaller than the ear-opening, sometimes almost entirely absent. Rostral four-sided, nearly twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 10 to 12 upper and 8 to 10 lower labials; mental large, triangular or pentagonal; two or three pairs of chin-shields, the median in contact behind the point of the mental. Abdominal scales moderate, cycloid, imbricate. Male with a series of 30 or 36 femoral pores, not interrupted on the præanal region. Tail rounded, feebly depressed, covered above with very small smooth scales and six longitudinal series of keeled tubercles, below with a median series of transversely dilated plates. Greyish or pinkish brown above, uniform or more or less distinctly marbled with darker; head generally variegated with brown; a more or less defined brown streak, light-edged above, on the side of the head, passing through the eye, extending sometimes along the side of the body; lower surfaces whitish.

From snout to vent 2·2 inches; tail 2·25.

Hab. Southern India and Ceylon, China, Indo-China, Burma, Malay peninsula and Archipelago, Islands of the Western Pacific and Indian Oceans.

86. Hemidactylus gleadovii.

Hemidactylus maculatus, *Kelaart, Prodr.* p. 158; *Günth. Rept. B. I.* p. 107; *Theob. Cat.* p. 75.
? Gecko tytleri, *Tytler, J. A. S. B.* xxxiii, 1864, p. 547.
Hemidactylus gleadowi, *Murray, Zool. Sind,* p. 360, pl. —, fig. 3; *Bouleng. Cat. Liz.* i, p. 129.
Hemidactylus kushmorensis*, *Murray, A. M. N. H.* (5) xiv, 1884, p. 109; *Boul. l. c.* p. 135.
Hemidactylus murrayi, *Gleadow, Journ. Bomb. N. H. Soc.* ii, 1887, p. 49.

Head oviform; snout longer than the distance between the eye and the ear-opening, $1\frac{1}{4}$ to $1\frac{1}{3}$ the diameter of the orbit; forehead concave; ear-opening oval, oblique, about half the diameter of the

Fig. 27.—*Hemidactylus gleadovii.*

eye. Body and limbs moderate. Digits moderately dilated, free, inner well developed; infradigital lamellæ with strongly curved anterior border, 4 to 6 under the inner digits, 6 to 8 under the median. Head covered anteriorly with convex granular, some-

* Specimens recently received from Mr. Murray, as typical of his *H. kushmorensis* from Upper Sind, are identical with *H. gleadovii.* The dorsal tubercles are keeled.

times keeled, scales, posteriorly with minute granules intermixed with round tubercles. Rostral subtetragonal, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three or four nasals; 8 to 10 upper and 7 to 9 lower labials; mental large, triangular or pentagonal, twice as long as the adjacent labials; chin-shields generally four, the inner largest, in contact behind the mental. Upper surfaces with minute granular scales intermixed with moderate-sized trihedral strongly keeled tubercles, the largest not measuring more than one third the diameter of the eye; they form 16 to 20 pretty regular longitudinal series on the back. Abdominal scales smooth, roundish, imbricate. Males with a series of femoral pores generally interrupted in the middle; altogether 16 to 24 pores. Tail rounded, tapering, depressed; above with small smooth scales and 6 or 8 longitudinal series of large, pointed, strongly keeled tubercles; below with a median series of transversely dilated plates. Brownish above, spotted with darker; a dark streak on the side of the head, passing through the eye; lower surfaces dirty white.

From snout to vent 2·3 inches; tail 2·25.

Hab. India, Ceylon, Burma, South China. The commonest house-gecko in India.

87. Hemidactylus turcicus.

Lacerta turcica, *Linn. Syst. Nat.* i, p. 362.
Hemidactylus karachiensis, *Murray, Zool. Sind,* p. 361, pl. —, fig. 2.
Hemidactylus turcicus, *Bouleng. Cat. Liz.* i, p. 126.

Snout rounded, about as long as the distance between the eye and the ear-opening, $1\frac{1}{4}$ to $1\frac{1}{3}$ the diameter of the orbit; forehead slightly concave; ear-opening oval, oblique, not quite half the diameter of the eye. Body and limbs moderate. Digits rather variable in length, the inner always well developed; 6 to 8 lamellæ under the inner digits, 8 to 10 under the fourth finger, and 9 to 11 under the fourth toe. Head anteriorly with large granules, posteriorly with minute granules intermixed with round tubercles. Rostral four-sided, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 7 to 10 upper and 6 to 8 lower labials; mental large, triangular, at least twice as long as the adjacent labials, its point between two large chin-shields, which may be in contact behind it; a smaller chin-shield on each side of the larger pair. Upper surface of body covered with minute granules intermixed with large tubercles; these are generally larger than the interspaces between them, suboval, trihedral, and arranged in 14 or 16 pretty regular longitudinal series. Abdominal scales small, smooth, roundish-hexagonal, imbricate. Males with a short angular series of 4 to 10 (exceptionally 2) præanal pores. Tail cylindrical, slightly depressed, tapering, covered above with minute scales and transverse series of large keeled tubercles, beneath with a series of

large transversely dilated plates. Light brown or greyish above, spotted with darker; many of the tubercles white; lower surfaces white.

From snout to vent 2 inches.

Hab. Sind; borders of the Mediterranean and of the Red Sea. Common at Karáchi, among stones.

88. Hemidactylus persicus.

Hemidactylus persicus, *Anderson, P. Z. S.* 1872, p. 378, fig. 2; *Bouleng. Cat. Liz.* i, p. 131.

Snout rather acuminate, as long as the distance between the eye and the upper border of the ear-opening, $1\frac{1}{3}$ the diameter of the orbit; forehead concave; interorbital space very narrow; upper eyelid strongly fringed; ear-opening large, obliquely crescentic, the concavity being directed forwards and upwards, its diameter equalling three fourths that of the eye. Body and limbs moderate. Digits free, moderately dilated, inner well developed; infradigital lamellæ obliquely curved; 10 lamellæ under the thumb, 10 under the third finger, 9 under the inner toe, and 12 under the third toe. Snout covered with large convex granular scales, largest between the eye and the nostril; hinder part of head with minute granules, and scattered ones of a larger size. Rostral four times as broad as deep (having fused with the anterior labial on each side); nostril above the rostral, between the latter and three nasals; 10 or 11 upper and 9 lower labials; mental large, triangular, twice as long as the adjacent labial, its point between two large chin-shields which are in contact behind it; a small chin-shield on each side of the large pair. Upper surface of body covered with small irregular flat granules and moderately large, trihedral, strongly keeled tubercles arranged in 14 or 16 rather irregular longitudinal series; the largest tubercles measure about one fourth the diameter of the eye. Abdominal scales small, smooth, rounded, imbricate. Male with a short angular series of 8 præanal pores. Tail cylindrical, tapering, covered above with small, irregular, imbricate smooth scales and scattered pointed tubercles forming four or six longitudinal series, beneath with a series of transversely dilated plates. Pale yellowish brown, with six faint brownish transverse narrow dorsal bands, the tubercles in these areas being almost black; a dark brown streak from the nostrils through the eye above the ear, with a whitish line above it; lips whitish.

From snout to vent 2·75 inches; tail 3·2.

Hab. Sind; Persia.

89. Hemidactylus maculatus.

Hemidactylus maculatus, *Dum. & Bibr. Erp. Gén.* iii, p. 358 (part.); *Bouleng. Cat. Liz.* i, p. 132.

Hemidactylus sykesii, *Günth. Rept. B. I.* p. 108, pl. xii, fig. C.

Head large, oviform; snout longer than the distance between

the eye and the ear-opening, $1\frac{1}{4}$ the diameter of the orbit; forehead concave; canthus rostralis swollen; ear-opening large, oval. Body and limbs moderate. Digits moderately dilated, free, inner well developed; infradigital lamellæ almost perfectly straight, 9 to 11 under the inner digit, 12 or 13 under the median. Head covered anteriorly with convex granular scales, smaller in the frontal concavity, posteriorly with minute granules intermixed with round tubercles; rostral subtetragonal, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three or four nasals; 10 to 12 upper and 9 or 10 lower labials; mental large, triangular or pentagonal, twice as long as the adjacent labials; two pairs of chin-shields, the inner the larger, elongate, in contact behind the mental. Upper surfaces with minute, granular scales intermixed with moderate-sized trihedral, more or less strongly keeled tubercles, the largest not measuring more than one third the diameter of the eye; they are arranged very irregularly on the back, in about 20 longitudinal series. Abdominal scales smooth, roundish, imbricate. Male with a long series of femoral pores, 19 to 25 on each side, interrupted on the præanal region. Tail rounded, tapering, depressed; above with small irregular keeled scales, and 6 or 8 longitudinal series of large trihedral tubercles; beneath with a median series of transversely enlarged plates. Brown above, with darker spots, generally confluent into transverse undulating bands on the back; two more or less distinct dark streaks on each side of the head, passing through the eye; lower surfaces dirty white.

From snout to vent 4·5 inches; tail 5.

Hab. Deccan and Southern India.

90. Hemidactylus triedrus.

Gecko triedrus, *Daud. Rept.* iv, p. 155; *Lesson, in Bélang. Voy. Ind. Or.* p. 311, pl. v, fig. 1.

Hemidactylus triedrus, *Kelaart, Prodr.* p. 157; *Günth. Rept. B. I.* p. 107; *Theob. Cat.* p. 75; *Bouleng. Cat. Liz.* i, p. 133.

Head large, oviform; snout longer than the distance between the eye and the ear-opening, $1\frac{2}{5}$ the diameter of the orbit; forehead concave; ear-opening large, suboval, oblique, measuring about half the diameter of the eye. Body and limbs moderate. Digits free, moderately dilated, inner well developed; infradigital lamellæ slightly oblique, 6 or 7 under the inner digits, 8 to 10 under the median digits. Snout covered with convex granules, which may be keeled; hinder part of head with minute granules intermixed with roundish tubercles. Rostral subquadrangular, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three or four nasals; 8 to 10 upper and 7 or 8 lower labials; mental large, triangular or pentagonal, at least twice as long as the adjacent labials; four chin-shields, median pair largest and in contact behind the mental. Upper surface of body covered with small

flat granular scales, and large trihedral tubercles arranged in 16 to 20 more or less irregular longitudinal series; these tubercles vary somewhat in size according to specimens, but the largest never exceed two fifths the diameter of the eye. Abdominal scales large, smooth, rounded, imbricate. Males with a series of præanal pores, interrupted mesially; 6 to 8 pores on each side. Tail rounded, feebly depressed, tapering, covered above with irregular, small, smooth imbricated scales and rings of large, pointed, keeled tubercles, beneath with a median series of transversely dilated plates. Light pinkish brown above, generally with more or less defined transverse darker bands bordered by pure white tubercles surrounded by deep-brown rings; young very regularly barred with dark brown, there being four dark bars between head and hind limbs; a more or less defined dark-brown streak, white-edged above, on the side of the head, passing through the eye; lower surfaces white.

From snout to vent 3·7 inches; tail 3·8.

Hab. Central and Southern India, Ajmere, Ceylon.

91. Hemidactylus subtriedrus.

Hemidactylus subtriedrus, *Jerdon, J. A. S. B.* xxii, 1853, p. 467; *Theob. Cat.* p. 75; *Bouleng. Cat. Liz.* i, p. 134.

Differs from *H. triedrus* in the following points:—Head more depressed. Infradigital lamellæ more numerous, 10 under the thumb, 11 under the median finger, 9 under the inner toe, and 12 under the median toe. Ventral scales smaller. 10 lower labials. Light brown above, with five undulating dark brown cross bands on the body, the anterior, on the neck, confluent with a dark streak passing through the eye and light-edged above.

From snout to vent 2·25 inches.

Hab. Nellore and Ellore districts.

92. Hemidactylus depressus.

Hemidactylus depressus, *Gray, Zool. Misc.* p. 58; *Bouleng. Cat. Liz.* i, p. 134.

Hemidactylus pieresii, *Kelaart, Prodr.* p. 159; *Theob. Cat.* p. 76.

Head oviform; snout longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ to $1\frac{1}{4}$ the diameter of the orbit; forehead concave; ear-opening oblique, nearly half the diameter of the eye. Body and limbs moderate. The skin forms a fold on each side of the belly, from axilla to groin. Digits distinctly webbed at the base, moderately dilated, inner well developed, with curved, scarcely oblique lamellæ; 7 (or 6) under the inner digits, 9 or 10 under the median fingers, 10 or 11 under the median toes. Snout covered with granular scales, largest in front of the orbits; hinder part of head with minute granules intermixed with round tubercles. Rostral subquadrangular, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial,

and three or four nasals; 10 to 12 upper and 8 to 10 lower labials; mental large, triangular or pentagonal, twice as long as the adjacent labials; four large chin-shields, median pair largest, forming a long suture behind the point of the mental. Upper surface of body covered with small flat granules intermixed with trihedral tubercles, forming 16 to 20 very irregular longitudinal series; the largest tubercles measure about one fourth the diameter of the eye. Abdominal scales moderate, smooth, rounded, imbricate. Males with a long series of femoral pores interrupted mesially; 17 or 18 pores on each side. Tail tapering, much depressed, flat below, with angular lateral edge; it is covered above with small pointed imbricate scales, which are enlarged and raised on the sides, forming a strong denticulation, and with six or eight series of spine-like tubercles forming rings; a median series of regular transversely dilated plates beneath. Upper parts light brown, marbled or cross-barred with brown; a dark brown streak, white-edged above, on the side of the head, passing through the eye; lower surfaces whitish.

From snout to vent 3·2 inches; tail 3.

Hab. Ceylon, Malay Peninsula.

93. Hemidactylus leschenaultii.

Hemidactylus leschenaultii, *Dum. & Bibr. Erp. Gén.* iii, p. 364; *Günth. Rept. B. I.* p. 109; *Theob. Cat.* p. 77; *Bouleng. Cat. Liz.* i, p. 136.

Hemidactylus coctæi, part., *Günth. l. c.* p. 109.

Hemidactylus kelaartii, *Theob. Cat. Rept. As. Soc. Mus.* p. 29.

Hemidactylus marmoratus, *Blanf. J. A. S. B.* xxxix, 1870, pt. 2, p. 363, pl. xvi, figs. 1-3.

Snout longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ to $1\frac{2}{5}$ the diameter of the orbit; forehead concave, the supraorbital ridges prominent in full-grown specimens; ear-opening rather large, oval, vertical. Body and limbs moderate. A slight fold of the skin on the side of the belly, from axilla to groin. Digits free, strongly dilated, inner well developed; 6 or 7 (rarely 5) lamellæ under the inner digits, 9 to 11 under the median. Head covered with minute granules posteriorly, with larger ones anteriorly; rostral four-sided, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, three nasals, and generally the first labial; 10 to 12 upper and 8 or 9 lower labials; mental large, triangular or pentagonal; two pairs of chin-shields, the inner the larger and in contact behind the mental. Upper surface of body covered with small granules, uniform or intermixed with more or less numerous scattered round tubercles. Abdominal scales moderate, cycloid, imbricate. Male with a series of femoral pores interrupted on the præanal region; 12 to 16 pores on each side. Tail depressed, flat below, covered above with small smooth scales and six longitudinal series of conical tubercles; beneath with a median series of transversely dilated plates. Grey above, with darker markings, forming undu-

lating cross-bars, rhomboidal spots on the middle of the back, or regular longitudinal bands; a dark band from the eye to the shoulder; lower surfaces white.

From snout to vent 3·2 inches; tail 3·25.

Hab. India, Ceylon, Malay Peninsula. A house-gecko.

94. Hemidactylus coctæi.

Hemidactylus coctæi, *Dum. & Bibr. Erp. Gén.* iii, p. 365; *Günth. Rept. B. I.* p. 109 (part.); *Theob. Cat.* p. 77; *Murray, Zool. Sind*, p. 359; *Bouleng. Cat. Liz.* i, p. 137.
Boltalia sublævis, *Gray, Zool. Misc.* p. 58.
Hemidactylus bengaliensis, *Anders. J. A. S. B.* xl, 1871, p. 14.

Snout longer than the distance between the eye and the ear-opening, 1⅓ to 1½ the diameter of the orbit; forehead concave; ear-opening rather large, oval, oblique. Body and limbs moderate. Digits free, strongly dilated, inner well developed, with nearly straight lamellæ beneath; the latter 9 or 10 (rarely 8) under the inner digits, and 11 to 13 under the median digits. Head covered with minute granules posteriorly, with larger ones anteriorly; rostral four-sided, not twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 12 to 15 upper and 10 or 11 lower labials; mental large, triangular or pentagonal; two or three pairs of chin-shields, median largest and in contact behind the mental. Upper surfaces covered with small granules, among which some larger ones are sometimes scattered on the sides. Abdominal scales moderate, cycloid, imbricate. Male with a short series of 5 or 6 femoral pores under each thigh. Tail depressed, flat beneath, covered above with small smooth scales and four or six longitudinal series of conical tubercles; beneath with a median series of transversely dilated plates. Grey above, uniform or with indistinct darker markings; lower surfaces white.

From snout to vent 3 inches; tail 3·2.

Hab. India, Burma, Malay Peninsula, Baluchistan, Persia, Arabia, Abyssinia. A common house-gecko.

95. Hemidactylus giganteus.

Hemidactylus giganteus, *Stoliczka, J. A. S. B.* xli, 1872, p. 99, pl. ii, fig. 2; *Theob. Cat.* p. 78; *Bouleng. Cat. Liz.* i, p. 138.

Snout longer than the distance between the eye and the ear-opening, 1½ the diameter of the orbit; forehead concave; ear-opening rather large, suboval, vertical. Body and limbs stout. Digits free, inner well developed, strongly dilated; with straight transverse lamellæ beneath; 11 or 12 under the inner digits, 13 to 15 under the median. Upper surfaces covered with uniform small granular scales, somewhat larger on the snout, smallest on the hinder part of the head. Rostral quadrangular, not quite twice as broad as deep; nostril pierced between the rostral and three nasals;

12 to 15 upper and 11 to 13 lower labials; mental large, pentagonal; two pairs of chin-shields, the inner the larger. Abdominal scales rather small, cycloid, imbricate. Male with a series of femoral pores interrupted mesially; 19 to 22 pores on each side. Tail without large tubercles. Olive-grey above, with irregular dark, pale-edged marks in imperfect circles, tending to form, or forming, 4 or 5 transverse undulating bands on the body; below uniform white.

From snout to vent 4·8 inches.

Hab. Godavari Valley and Malabar. Found on trees.

96. Hemidactylus bowringii.

Doryura bowringii, *Gray, Cat. Liz.* p. 156.
Leiurus berdmorei, *Blyth, J. A. S. B.* xxii, 1853, p. 646.
Doryura berdmorei, *Theob. Journ. Linn. Soc.* x, 1868, p. 29; *id. Cat.* p. ix.
Hemidactylus berdmorei, *Stoliczka, J. A. S. B.* xli, 1872, p. 100.
Hemidactylus bowringii, *Bouleng. Cat. Liz.* i, p. 139, pl. xii, fig. 2.

Snout longer than the distance between the eye and the ear-opening, $1\frac{2}{5}$ the diameter of the orbit; forehead slightly concave; ear-opening small, roundish. Body and limbs moderate; a slight fold of the skin along the flank. Digits free, moderately dilated, inner well developed; infradigital lamellæ obliquely curved, 5 under the thumb, 7 or 8 under the fourth finger, 5 or 6 under the first toe, and 9 or 10 under the fourth toe. Upper surfaces covered with uniform small granular scales, largest on the snout, smallest on the occiput. Rostral four-sided, twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three or four nasals; 9 to 11 upper and 7 or 8 lower labials; mental large, triangular, followed by a pair of chin-shields; an outer pair of much smaller chin-shields. Abdominal scales moderate, cycloid, imbricate. Male with a series of præanal pores, interrupted mesially, composed of 13 pores on each side. Tail depressed, rounded, oval in section, covered above with uniform small scales, beneath with a median series of transversely dilated plates. Light brown above, with darker spots, having sometimes a tendency to form four longitudinal bands on the back; frequently small whitish spots on the body and limbs; a dark streak passing through the eye; tail above with small chevron-shaped markings; lower surfaces whitish.

From snout to vent 1·3 inches; tail 2.

Hab. Eastern India (Sikhim and ? Godávari Valley), Burma and Tenasserim.

97. Hemidactylus karenorum.

Doryura karenorum, *Theob. Journ. Linn. Soc.* x, 1868, p. 30, *and Cat.* p. ix.
Hemidactylus karenorum, *Bouleng. Cat. Liz.* i, p. 140.

Snout longer than the distance between the eye and the ear-opening, $1\frac{1}{3}$ to $1\frac{2}{5}$ the diameter of the orbit; forehead slightly con-

cave; ear-opening small, roundish. Body and limbs moderate; a slight fold of the skin along the sides of the belly, and another bordering the thighs behind. Digits free, moderately dilated, inner well developed; infradigital lamellæ obliquely curved, 5 under the thumb, 9 under the fourth finger, 5 or 6 under the first toe, and 10 to 12 under the fourth toe. Head covered with minute granules posteriorly, with larger ones anteriorly; rostral four-sided, not quite twice as broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 11 or 12 upper and 7 to 9 lower labials; mental large, triangular; two pairs of chin-shields. Upper surface of body covered with minute granules intermixed with numerous small convex round tubercles. Abdominal scales moderate, cycloid, imbricate. Male without præanal or femoral pores (?). Tail depressed, flat below, with sharp denticulated lateral edge; the scales on the upper surface very small, equal; those on the lower surface larger, imbricate, with a median series of large transverse plates. Light grey-brown above, with rather indistinct darker variegation; lower surfaces whitish.

From snout to vent 2 inches; tail 2·2.

Hab. Pegu.

98. Hemidactlylus garnoti.

Hemidactylus garnotii, *Dum. & Bibr. Erp. Gén.* iii, p. 368; *Bouleng. Cat. Liz.* i, p. 141.
Doryura gaudama, *Theob. Journ. Linn. Soc.* x, 1868, p. 30; *id. Cat.* p. ix.
Hemidactylus (Doryura) mandellianus, *Stoliczka, J. A. S. B.* xli, 1872, p. 101, pl. iii, figs. 1, 2.
Hemidactylus blanfordii, *Bouleng. l. c.* p. 141.

Snout obtusely pointed, longer than the distance between the eye and the ear-opening, $1\frac{1}{2}$ to $1\frac{2}{3}$ the diameter of the orbit; forehead slightly concave; ear-opening small, rounded. Body and limbs moderate. A slight but distinct fold of the skin along the flanks, and another bordering the hind limb posteriorly. Digits free or with a very slight rudiment of web, moderately dilated, inner well developed; infradigital lamellæ oblique, 6 or 7 under the inner digits, 10 to 12 under the fourth finger, and 11 to 14 under the fourth toe. Upper surfaces and throat covered with minute granular scales, a little larger on the snout; abdominal scales moderate, imbricate. Rostral subquadrangular, with median cleft above; nostril pierced between the rostral and three nasals; 12 or 13 upper and 9 to 11 lower labials; mental large, triangular, in contact posteriorly with a pair of pentagonal chin-shields, followed by a second smaller pair; the anterior pair of chin-shields in contact with the first infralabial, and with each other mesially; the posterior pair separated from each other, and also completely or nearly completely from the labials. Tail depressed, flat beneath, with sharp denticulated lateral edge; the scales on the upper surface very small, equal; those on the lower surface

larger, imbricate, with a median series of large, transversely dilated plates. Brownish grey above, uniform or with more or less distinct brown and whitish spots; lower surfaces uniform whitish. (Theobald mentions 19 pores on each thigh in his *Doryura gaudama*, which appears to me, from the short description, identical with, and the male of, the present species.)

From snout to vent 2·3 inches; tail 2·6.

Hab. Sikhim, Burma, Malay Peninsula and Archipelago, South Pacific Islands.

A number of specimens (from Burma and Java), which I have been able to examine since the publication of the Catalogue of Lizards have convinced me that the characters upon which I separated *H. blanfordii* from *H. garnoti* are insufficient.

Hemidactylus mortoni, Theobald, Journ. Linn. Soc. x, p. 32, and Cat. Rept. Brit. Ind. p. 78, is probably allied to, or identical with, one of the three preceding species, but the description is insufficient for ensuring its recognition:—

"Back covered with granular scales, with a scattered tubercle here and there, just perceptibly larger than the rest. Thumb well developed. Colour dark brown, mottled pepper and salt, with black spots and small white rosettes of 6 white scales each. Tail barred with black above. Length 3·50 inches."

Described from an immature male taken at Teikgyie, Rangoon.

99. Hemidactylus platyurus.

Stellio platyurus, *Schneid. Amph. Phys.* ii. p. 30.
Nycteridium schneideri, *Günth. Rept. B. I.* p. 111.
Nycteridium himalayanum, *Anders. J. A. S. B.* xl, 1871, p. 15.
Nycteridium platyurus, *Theob. Cat.* p. 79.
Hemidactylus platyurus, *Bouleng. Cat. Liz.* i, p. 143.

Snout longer than the distance between the eye and the ear-opening, 1½ the diameter of the orbit; forehead concave; ear-opening small, oval, oblique. Body and limbs moderate, much depressed; a cutaneous expansion from axilla to groin, and another bordering the hind limb posteriorly. Digits strongly dilated, about half-webbed, inner well developed; 5 or 6 lamellæ under the inner, and 7 to 9 under the median digits. Upper surfaces covered with uniform small granules, largest on the snout. Rostral four-sided, not quite so broad as deep, with median cleft above; nostril pierced between the rostral, the first labial, and three nasals; 9 to 11 upper and 7 or 8 lower labials; mental large, triangular or pentagonal, in contact with two large chin-shields, followed by two smaller ones. Abdominal scales moderate, cycloid, imbricate. Male with an uninterrupted series of femoral pores, 17 or 18 on each side. Tail much depressed, flat beneath, with sharp denticulated lateral edge, covered above with uniform small granules, inferiorly with a median series of transversely dilated plates. Grey above, marbled with darker; generally a dark streak from eye to shoulder; white beneath.

From snout to vent 2·25 inches; tail 2·2.

Hab. Ceylon, N.E. India (Darjeeling), Burma, Malay Peninsula and Archipelago, South China and Cochinchina.

Genus **TERATOLEPIS**,

Günth. P. Z. S. 1869, p. 504.

Digits dilated, with a double series of lamellæ beneath, with elongate compressed distal joint rising from within the extremity of the dilated part; all clawed. Ear concealed. Body covered with large strongly imbricate scales. Pupil —?

Distribution. India. A single species.

100. Teratolepis fasciata.

Homonota fasciata, *Blyth, J. A. S. B.* xxii, 1853, p. 468.
Teratolepis fasciata, *Günth. P. Z. S.* 1869, p. 505; *Theob. Cat.* p. 95; *Bouleng. Cat. Liz.* i, p. 145.

Body somewhat depressed; limbs rather long and slender. Head covered with polygonal flat scales. Seven lower labials; mental large, triangular; two larger anterior chin-shields, in contact behind the mental, followed by others passing gradually into the small gular granules. Dorsal scales large, lozenge-shaped, slightly keeled; ventral scales much smaller, smooth. Tail depressed, swollen, tapering at the end, covered with imbricate irregular scales, some of those of the upper surface being extremely large. Greyish above, with five brown longitudinal bands, which at regular intervals are interrupted by white spots forming cross bands; seven of these cross bands on the neck and trunk.

Head and body 1·5 inches.

Hab. Deccan (Jálna) and Sind.

Genus **GEHYRA**,

Gray, Zool. Misc. p. 57, 1842.

Digits strongly dilated, free or webbed at the base, with undivided or mesially divided transverse lamellæ beneath; distal phalanges free, elongate, compressed, clawed, raised from within the extremity of the dilatation; inner digits without free distal phalanges, clawless, or with a very indistinct retractile claw. Upper surfaces covered with granular scales; belly with cycloid imbricate scales. Pupil vertical. Males with femoral or præanal pores.

Distribution. East Indies; Australia; islands of the Indian and Pacific Oceans; Mexico. Of the ten known species, one occurs in Burma and Ceylon.

101. Gehyra mutilata.

Hemidactylus (Peropus) mutilatus, *Wiegm. N. Acta Ac. Leop.-Carol.* xvii, 1835, p. 238.

Hemidactylus peronii, *Dum. & Bibr. Erp. Gén.* iii, p. 352, pl. xxx, fig. 1; *Kelaart, Prodr.* p. 187.
Peripia peronii, *Günth. Rept. B. I.* p. 110; *Theob. Cat.* p. 79.
Gecko pardus, *Tytler, J. A. S. B.* xxxiii, 1864, p. 547.
? Gecko harrietti, *Tytler, l. c.* p. 548.
Gehyra mutilata, *Bouleng. Cat. Liz.* i, p. 148.

Fig. 28.—Foot of *Gehyra mutilata*, lower surface, and side view of toe.

Head longer than broad; snout longer than distance between eye and ear-opening, about $1\frac{1}{3}$ the diameter of the orbit; forehead with a median groove; ear-opening moderately large, suboval. Body and limbs moderately elongate, depressed; a fold of the skin bordering the hind limb posteriorly. Digits short, more or less webbed at the base; the inferior lamellæ angular, divided by a median groove. Upper surface and throat covered with small granular scales, largest and flat on the back. Abdominal scales moderate. Rostral quadrangular, broader than deep, with a median cleft above; nostril pierced between the rostral, the first labial, and three nasals, the upper much the largest and generally in contact with its fellow; 8 or 9 upper and 6 or 7 lower labials; mental moderately large, pentagonal; chin-shields 3 pairs, inner very large, elongate, outer small, frequently broken up into small scales. Femoral pores in a doubly curved line, angular in the middle, 14 to 19 on each side. Tail depressed, normally with a sharpish, minutely serrated lateral edge; its upper surface covered with very small flat scales, its lower surface generally with a median series of large transversely dilated scales. Greyish or reddish brown above, uniform or dotted or variegated with darker; lower surfaces uniform whitish.

From snout to vent 2·25 inches; tail 2·25.

Hab. Ceylon, Burma, Malay Peninsula and Archipelago, New Guinea, Mascarenes and Seychelles, Western Mexico.

Genus LEPIDODACTYLUS,

Fitzinger, Syst. Rept. p. 98, 1843.

Digits more or less dilated, free or with a rudiment of web, beneath with transverse lamellæ divided by a median groove, with very short compressed distal clawed joint rising from the extremity of the digit; inner digit clawless. Body covered above with

granular scales, beneath with juxtaposed or subimbricate scales. Pupil vertical. Males with præanal or femoral pores.

Distribution. East Indies; Polynesia; South-west Australia. 11 or 12 species are known.

Fig. 29.—Foot of *Lepidodactylus aurantiacus*, lower surface.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Thumb rudimentary; tail subcylindrical.
- *a.* 4 or 5 divided lamellæ under median toe. *L. ceylonensis*, p. 98.
- *b.* 2 divided lamellæ under median toe.... *L. aurantiacus*, p. 98.

B. Thumb well developed; tail depressed, flat beneath, with sharpish lateral edge .... *L. lugubris*, p. 99.

102. Lepidodactylus ceylonensis.

Lepidodactylus ceylonensis, *Bouleng. Cat. Liz.* i, p. 164, pl. xiii, fig. 3.

Head much longer than broad; snout as long as distance between eye and ear-opening, $1\frac{1}{2}$ times diameter of orbit; ear-opening small, oval. Body elongate; limbs short, fore limb not measuring half the distance between axilla and groin. Digits free, inner rudimentary; 4 or 5 divided lamellæ under the toes, the rest of the lower surface covered with small squarish scales. Head and body covered with very small granular scales, slightly larger on the snout, larger and flat on the belly. Rostral twice as broad as deep; nostril pierced between rostral, first upper labial, and three small nasals; 11 or 12 upper and as many lower labials; mental small, subtriangular; no chin-shields. Tail cylindrical, covered with uniform small scales. Brown above, with small round yellowish spots; a dark streak from the tip of the snout to the shoulder, passing through the eye.

From snout to vent 1·5 inches; tail 1·33.

Hab. Ceylon (Gampola).

103. Lepidodactylus aurantiacus.

Hemidactylus aurantiacus, *Beddome, Madras Journ. Med. Sc.* 1870.
Lepidodactylus aurantiacus, *Bouleng. Cat. Liz.* i, p. 164, pl. xiii, fig. 4.

Head oviform, longer than broad; snout rounded, very convex, slightly shorter than distance between eye and ear-opening, $1\frac{1}{3}$

diameter of orbit; ear-opening very small, round. Body elongate, more so in females than in males; limbs short, fore limb measuring half the distance between axilla and groin, or rather less. Digits short, free, inner very small, rudimentary; only two large chevron-shaped divided lamellæ under the distal part of the digits, followed by transverse undivided lamellæ, decreasing in width. Head covered with very minute granules; rostral and mental very small, former four-sided, latter pentagonal or triangular; nostril pierced between rostral, first labial, and several granules; labials very small, 9 or 10 upper and as many lower; no chin-shields. Back covered with very small granular scales; abdominal scales a little larger, flat, imbricate. Male with an angular series of 7 to 9 præanal pores. Tail cylindrical, tapering, covered with small imbricated smooth scales, larger below. Grey-brown above, with, along the head and back, dark-brown undulating lines, which may be broken up into spots; a dark brown streak from the tip of the snout to the fore limb, passing through the eye; whitish dots scattered on the head and back; tail with darker spots or annuli and two large whitish black-edged spots at the base, frequently confluent mesially. Lower surfaces whitish, more or less speckled with brownish.

From snout to vent 1·4 inches; tail 1·25.

Hab. Shevaroys, S. India.

104. Lepidodactylus lugubris.

Platydactylus lugubris, *Dum. & Bibr. Erp. Gén.* iii, p. 304.
Peripia cantoris, *Günth. Rept. B. I.* p. 110; *Theob. Cat.* p. 80.
Lepidodactylus lugubris, *Bouleng. Cat. Liz.* i, p. 165.

Head much longer than broad; snout subacuminate, longer than distance between eye and ear-opening, about $1\frac{1}{2}$ diameter of orbit; forehead with a median groove; ear-opening small, round. Body and limbs moderate. Digits moderate, inner well developed, with a rudiment of web; inferior lamellæ numerous, 7 or 8 under the fingers, 8 or 9 under the toes. Upper surface and throat covered with very minute granules, a little larger on the snout; scales on the belly much larger, flat, juxtaposed or slightly imbricate. Rostral quadrangular, broad; nostril pierced between rostral, first upper labial, and two or three nasal shields, the upper separated from its fellow by one or three small shields; 11 to 13 upper and 10 to 11 lower labials; mental small, smaller than the adjacent labials; four transverse rows of small chin-shields. Femoral pores in a long series, angular in the middle, 25 altogether. Tail flat beneath, with sharpish, sometimes feebly serrated, lateral edge; caudal scales small, flat, equal. Upper surfaces light pinkish grey or brownish, generally with a series of small blackish or purplish-brown spots on each side of the vertebral line; a purplish-brown streak from the end of the snout to the ear, passing through the eye; labials generally finely dotted with brown; lower surfaces white.

From snout to vent 1·75 inches; tail 1·4.

Hab. Burma, Andamans and Nicobars, Malay Peninsula and Archipelago, Papuasia and Polynesia.

Genus **HOPLODACTYLUS**,

Fitzinger, Syst. Rept. p. 100, 1843.

Digits free or shortly webbed at the base, more or less dilated; the distal phalanges slender, elongate, clawed, forming an angle with the basal portion; a series of transverse lamellæ under the latter. Scales small, granular, equal. Pupil vertical. Males with præanal, or præanal and femoral pores.

Distribution. South-Pacific islands; Southern India. A small genus of only 5 species.

a *b*

Fig. 30.—Foot of *Hoplodactylus anamallensis*.
a. Upper surface. *b.* Lower surface.

Synopsis of Indian Species.

16 lamellæ under fourth toe .... *H. duvaucelii*, p. 100.
7 or 8 lamellæ under fourth toe .... *H. anamallensis*, p. 101.

105. **Hoplodactylus duvaucelii.**

Platydactylus duvaucelii, *Dum. & Bibr. Erp. Gén.* iii, p. 312.
Pentadactylus duvaucelii, *Günth. Rept. B. I.* p. 118.
Hoplodactylus duvaucelii, *Bouleng. Cat. Liz.* i, p. 172.

Head oviform; snout slightly longer than distance between eye and ear-opening; forehead slightly concave; ear-opening rather large, oval, oblique. Body and limbs moderate. Digits relatively much dilated, width of dilated part contained about twice and a half in length of same; length of slender distal part equals one third length of digit; 16 lamellæ under fourth toe; a distinct web at base of digits, absent between two outer toes. Head covered with granular scales, minute on the posterior half, considerably larger on the snout. Rostral pentagonal, with trace of median cleft above; nostril pierced between rostral, first upper labial, and four small nasals; 14 upper and 12 lower labials; mental trapezoid, a

little shorter than the adjacent labials, followed by a small median chin-shield; behind the labials small irregular scales passing gradually into the minute granules of the throat. Dorsal scales minutely granular; abdominal scales very small, subimbricate. Five angular series of præanal pores, the two upper extending as long femoral series; 50 pores in the upper series, from one end to the other. Tail rounded, tapering, covered with very small subquadrangular juxtaposed scales arranged in verticils. Greyish above, indistinctly marbled with darker; lower surfaces dirty white, immaculate.

From snout to vent 5 inches.

Hab. This species was described in 1836 from specimens said to have been brought from Bengal by Alfred Duvaucel; but it has not been rediscovered since.

106. **Hoplodactylus anamallensis.**

Gecko anamallensis, *Günth. P. Z. S.* 1875, p. 226.
Hoplodactylus anamallensis, *Bouleng. Cat. Liz.* i, p. 175, pl. xiv, fig. 2.

Head shortly oviform; snout a little longer than distance between eye and ear-opening, $1\frac{1}{3}$ diameter of orbit; forehead very slightly concave; ear-opening small, oval, oblique. Body and limbs moderate. Digits free, not very strongly dilated, inner well developed: infradigital lamellæ openly angular, 5 under the inner digits, 6 or 7 under the median fingers, and 7 or 8 under the median toes. Upper surfaces uniformly granular, the granules scarcely larger on the snout than on the back. Rostral four-sided, more than twice as broad as high; nostril pierced between rostral, first labial, and three nasals; 9 or 10 upper and 7 or 8 lower labials; mental broadly triangular or pentagonal; two pairs of larger chin-shields anteriorly, followed by smaller ones passing gradually into the granules of the throat; abdominal scales cycloid, imbricate, smooth. Male with an uninterrupted series of femoral pores, 20 or 21 on each side. Tail cylindrical, tapering, slightly depressed at the base, above with small imbricate scales, beneath with a median series of transversely dilated plates. Grey-brown above, spotted or marbled with darker; a few scattered lighter dots; lower surfaces brownish white.

From snout to vent 1·75 inches; tail 1·4.

Hab. Anamallays, S. India.

Genus **GECKO**,

Laurenti, Syn. Rept. p. 43, 1768.

Digits strongly dilated, free or webbed at the base, with undivided lamellæ below, all but the thumb and inner toe with a very short compressed distal phalanx with retractile claw. Head and back covered with juxaposed granular scales or tubercles, belly with

small flat imbricate scales. Pupil vertical. Males with præanal or femoral pores.

Distribution. Japan, China, East Indies, New Guinea and neighbouring islands. 8 species are known.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Rostral not entering nostril; digits free.
a. Width of head equals twice distance from end of snout to orbit; throat covered with small flat granules.................... *G. verticillatus*, p. 102.
b. Width of head less than twice distance from end of snout to orbit; throat minutely granulate .... *G. stentor*, p. 103.
B. Rostral entering nostril; digits with a rudiment of web................................ *G. monarchus*, p. 103.

107. Gecko verticillatus.

Gecko verticillatus, *Laur. Syn. Rept.* p. 44; *Bouleng. Cat. Liz.* i, p. 183.

Gecko guttatus, *Daud. Rept.* iv, p. 122; *Günth. Rept. B. I.* p. 102; *Theob. Cat.* p. 71.

Head large; its width equals twice the distance from end of the snout to orbit, or from orbit to ear-opening; snout subtriangular, obtuse, $1\frac{3}{5}$ or $1\frac{2}{3}$ diameter of orbit; forehead concave; ear-opening narrow, oblique, its vertical diameter at least half diameter of orbit. Body and limbs moderate; digits free. Head covered with small convex polygonal scales; upper labials 12 to 14, the first entering the nostril; lower labials 10 or 11, gradually decreasing in size; mental very variable in shape; chin-shields 4 or 5 on each side, smaller than the labials, the inner pair generally not longer than the mental. Back covered with small juxtaposed flat granules and about 12 longitudinal series of mamilliform tubercles; throat with flat granules; abdominal scales moderately large. Pores in a short angular series on the præanal region, 13 to 24 altogether. Tail (when intact) slightly depressed, tapering, distinctly annulate, covered with subquadrangular smooth scales, much larger beneath, arranged in transverse series; each annulus is composed of 5 or 6 transverse rows of scales above, 3 beneath: also, on the upper surface, large conical tubercles, wide apart and symmetrically arranged. Slaty grey above, with red spots or vermiculations; tail annulate with darker and lighter; lower surfaces whitish, frequently indistinctly variegated with grey.

From snout to vent $6\frac{1}{2}$ inches; tail 6.

Hab. Eastern Bengal to Southern China and the Malay Peninsula and Archipelago. Found in houses as well as on trees. Known as "touktai" in Burma, from its loud call. This species and the following are the largest East-Indian geckos.

108. Gecko stentor.

Platydactylus stentor, *Cantor, J. A. S. B.* xvi, 1847, p. 624.
Gecko stentor, *Günth. Rept. B. I.* p. 102, pl. xi, fig. A; *Theob. Cat.* p. 72; *Bouleng. Cat. Liz.* i, p. 184.
Gecko verreauxii, *Tytler, J. A. S. B.* xxxiii, 1864, p. 546.

Head large, its width less than twice the distance from the end of the snout to the orbit; snout longer than in *G. verticillatus*, measuring $1\frac{2}{3}$ or $1\frac{3}{4}$ the diameter of the orbit and considerably more than the distance from the orbit to the ear-opening; forehead concave; ear-opening oval, oblique, its vertical diameter generally less than half the diameter of the orbit. Body and limbs rather more elongate than in *G. verticillatus*; digits free. The scales on the head and back similar to those of *G. verticillatus*, but smaller; upper labials 12 to 14, first entering the nostril; lower labials 10 to 12, gradually decreasing in size; chin-shields 3 to 5 on each side, smaller than the labials, the inner pair generally longer than the mental. Back with 10 or 12 longitudinal series of mamilliform tubercles. Throat covered with exceedingly small granules; ventral scales larger than in *G. verticillatus*. Præanal pores 11 to 16 altogether. Tail like that of *G. verticillatus*, but the scales on the upper surface much smaller, the annuli being composed of 10 or 11 transverse rows of scales; the large scales on the lower surface of the tail are much dilated transversely, forming generally two symmetrical series. Brown or brownish grey above, marbled with darker, with or without transverse rows of whitish spots,—a character of the young in this and the preceding species, but which may here persist throughout life; sometimes a linear, λ-shaped dark brown mark on the head; tail annulate with darker and lighter rings; lower surfaces whitish, generally dotted or variegated with greyish.

From snout to vent $7\frac{1}{2}$ inches; tail 7.

Hab. Chittagong, Burma, Andamans, Malay Peninsula, Sumatra, Java, Borneo.

109. Gecko monarchus.

Platydactylus monarchus, *Dum. & Bibr. Erp. Gén.* iii, p. 335.
Gecko monarchus, *Günth. Rept. B. I.* p. 103; *Theob. Cat.* p. 72; *Bouleng. Cat. Liz.* i, p. 187.

Head moderately large, oviform; snout longer than distance between eye and ear-opening, about $1\frac{2}{3}$ diameter of the orbit; forehead concave; ear-opening oval, oblique, its greatest diameter one third that of the orbit. Body and limbs moderately elongate; digits feebly dilated for the genus, with a rudiment of web. Snout covered with rather large granular scales, the rest of the head with very small granules intermixed with scattered larger ones; nostril pierced between the rostral and first labial; upper labials 10 or 11, lower labials 9 or 10; mental subtriangular; a large median pair of chin-shields, about three times as long as broad, bordered by a

few irregular smaller shields. Back and limbs covered with very small granules intermixed with numerous, irregularly arranged, rounded conical tubercles. Throat with very small granules; abdominal scales moderate. Femoral pores in a long series, forming a very open angle in the middle, 16 to 20 on each side. Tail slightly depressed, distinctly annulate, covered above with very small flat granular scales and transverse series of backwardly directed conical tubercles, beneath with large, rather irregular dilated scales; each annulus is composed of 12 to 14 transverse rows of scales above, 3 or 4 below. Brown or grey, spotted with blackish, a double series of spots along the middle of the back being constant; tail with more or less marked darker and lighter rings; lower surfaces whitish.

From snout to vent 3·25 inches; tail 4·16.

Hab. Ceylon; Malay Peninsula and Archipelago.

Genus **PTYCHOZOON**,

(Kuhl), Fitzinger, N. Class. Rept. p. 13, 1826.

Digits strongly dilated, entirely webbed, with undivided lamellæ below; all but the thumb and inner toe with a compressed curved distal phalanx with retractile claw, originating a little before the extremity of the digital expansion. Limbs and sides of head, body and tail with much developed membranous expansions acting as parachutes. Upper surfaces covered with juxtaposed granular scales and tubercles; lower surfaces with small, slightly imbricated scales; the parachute-membrane of the side covered above with imbricate square scales arranged like the bricks of a wall, scaleless below. Pupil vertical. Males with præanal pores.

A single species.

110. **Ptychozoon homalocephalum.**

Lacerta homalocephala, *Creveldt, Mag. Ges. Naturf. Fr. Berlin*, iii, 1809, p. 267, pl. viii.

Ptychozoon homalocephalum, *Cantor, J. A. S. B.* xvi, 1847, p. 626; *Günth. Rept. B. I.* p. 105; *Theob. Cat.* p. 73; *Bouleng. Cat. Liz.* i, p. 190.

Head oviform; snout longer than distance from eye to ear-opening, $1\frac{1}{2}$ diameter of orbit; forehead concave; ear-opening rather large, subcircular. Body and limbs moderate, depressed; digits short, not very unequal, webbed to the tips; the fore limbs bordered on each side by a broad dermal expansion; a similar expansion bordering the tibia on each side, the femur posteriorly only. The parachutes on the sides of the body nearly as broad as the latter. Another dermal lobe on the side of the head, below the ear-opening, from the angle of the mouth to the neck. Tail elongate, depressed, the sides fringed with a series of rounded

lobes, confluent into a broad rounded flap at the extremity. Head and back covered with small granular scales. Rostral large, quadrangular; nostril pierced between the rostral, the first labial, and three small nasals; 10 to 12 upper and as many lower labials; rostral small, subtriangular; 3 or 4 small chin-shields on each side,

Fig. 31.—*Ptychozoon homalocephalum.*

inner elongate. Back usually with scattered convex tubercles. Throat covered with small granules, belly with moderate scales. An angular series of about 25 præanal pores. Tail distinctly annulate, covered above with small flat granular scales and transverse series of conical tubercles, beneath with imbricate scales. Greyish or reddish brown above, with transverse undulating dark brown bands; a dark brown streak from the eye to the first dorsal band.

From snout to vent 3·75 inches; tail 3·6.

Hab. Arrakan, Pegu, Nicobars, Malay Peninsula, Sumatra, Borneo, Java, Loo Choo Islands.

Genus PHELSUMA,

Gray, Ann. Phil. (2) x, 1825, p. 199.

Digits strongly dilated, free, clawless, inner rudimentary, with undivided lamellæ below. Dorsal scales uniform, granular; ven-

trals flat, imbricate. Pupil round; eyelid distinct all round the eye. Males with præanal or femoral pores.

Fig. 32.—Foot of *Phelsuma andamanense*.
a. Lower surface. *b*. Upper surface.

Distribution. Seven or eight species are known from Madagascar, the Comoro, Seychelle, and Mascarene Islands, and one from the Andamans. Diurnal and arboreal.

111. Phelsuma andamanense.

Phelsuma andamanense, *Blyth, J. A. S. B.* xxix, 1860, p. 108; *Günth. Rept. B. I.* p. 112; *Theob. Cat.* p. 74; *Bouleng. Cat. Liz.* i, p. 212.

Gecko chameleon, *Tytler, J. A. S. B.* xxxiii, 1864, p. 548.

Snout twice as long as the distance between orbit and ear-opening, or as diameter of orbit. Upper part of rostral with a median cleft. Nostril pierced above the rostral and first labial, the suture between the two plates entering its lower border; 9 or 10 upper labials; 8 or 9 lower labials; chin-shields irregular, scarcely distinct from the surrounding scales; 2 or 3 scales between the naso-rostrals. Ear-opening small, round, one fourth or one third the diameter of the orbit. Dorsal scales all granular, perfectly smooth. Ventral scales smooth. Femoral pores 12 to 15 on each side. Tail not much depressed, narrower than the body; segments of tail rather indistinctly marked, composed of 7 transverse series on the side, of 9 above; lower surface of tail with a median series of transversely dilated scales, two narrower ones alternating with a broader one; all the caudal scales perfectly smooth. Greenish above, with more or less numerous orange spots, which, however, may be absent; an orange streak from the ear to the nostril, passing through the eye, and another, Λ-shaped, from eye to eye, are generally present; lower surfaces whitish, throat not spotted.

From snout to vent 2·5 inches; tail 2·5.

Hab. Andaman Islands.

Family II. EUBLEPHARIDÆ.

Differ from the *Geckonidæ*, to which they are closely related, in having the vertebræ opisthocœlous and the parietal bones united, as in the normal Lacertilia. Distinguished externally from all Indian *Geckonidæ* by the presence of connivent eyelids, another character in which they agree with the normal Lacertilia.

Only three genera are known, viz. *Psilodactylus* (West Africa), *Eublepharis* (Southern Asia and Central America), and *Coleonyx* (Central America).

Genus **EUBLEPHARIS**,

Gray, Phil. Mag. (2) ii, 1827, p. 56.

Digits short and cylindrical, with a row of lamellæ below, clawed, the claws only partially retractile into a small sheath. Pupil vertical. Males with præanal pores.

Distribution. Southern Asia; Central America, and Southern North America.

Five species are known, three of which are American.

Synopsis of Indian Species.

Dorsal tubercles broader than interspaces ...... *E. hardwickii*, p. 107.
Dorsal tubercles not broader than interspaces.... *E. macularius*, p. 108.

112. **Eublepharis hardwickii.**

Eublepharis hardwickii, *Gray, Phil. Mag.* (2) ii, p. 56; *Günth. Rept. B. I.* p. 119, pl. xi, fig. B; *Theob. Cat.* p. 94; *Bouleng. Cat. Liz.* i, p. 231.

Gymnodactylus lunatus, *Blyth, in Cantor, J. A. S. B.* xvi, 1847, p. 633; *id.* xxiii, 1854, p. 210.

Body stout; limbs rather short; digits short. Snout as long as distance between orbit and ear-opening; the latter large, suboval, vertical. Head covered with irregular polygonal scales, intermixed with enlarged tubercles on the temple and occiput; rostral subpentagonal, twice as broad as high, with median cleft above; 3 or 4 internasals; about 10 upper and as many lower labials; mental broadly pentagonal, in contact with two enlarged chin-shields, surrounded by irregular smaller ones passing gradually into the flat granules of the gular region. Body covered above with small, irregular, flat scales, intermixed with numerous roundish, subconical tubercles; these tubercles larger than the interspaces between them. Male with 14 to 18 præanal pores. Tail swollen, rounded, tapering at the end, verticillated, above with small flat scales and rows of enlarged subconical tubercles, beneath with larger flat scales arranged regularly. Above reddish brown and cream-coloured; the former colour occupies the head and forms two

broad bands across the baek, the anterior broadest, and three round the tail; the latter borders the upper lip and extends as a horseshoe-shaped band to the other side, passing across the neck; it also oecupies the interspace between the dorsal and caudal brown bands, which are by far the widest; lower surfaces white.

Total length 8 inches.

Hab. Bengal, Central and Southern India.

113. Eublepharis macularius.

Cyrtodactylus macularius, *Blyth, J. A. S. B.* xxiii, 1854, p. 738.
Eublepharis fasciolatus, *Günth. A. M. N. H.* (3) xiv, 1864, p. 429.
Eublepharis macularius, *Theob. Cat.* p. 94; *Murray, Zool. Sind,* p. 366; *Bouleng. Cat. Liz.* i, p. 232.
Eublepharis hardwickii (*non Gray*), *Murray, l. c.*

Fig. 33.—*Eublepharis macularius.*

Differs from the preeeding by the smaller and less numerous tubereles, the granular interspaces being as wide as the tubercles themselves; these are subeonieal or slightly keeled. Body and digits rather more elongate; 9 to 14 præanal pores in the male. Young with five chestnut-brown transverse bands from head to saerum, slightly broader than their interspaees, whieh are whitish, and similar bands forming rings on the tail. In the adult these bands usually become more indistinct, and the head and body are spotted or largely vermiculated with ehestnut-brown and whitish; in some, only the brown edges of the dorsal bands remain.

Total length 8 inches; grows to nearly a foot long, according to Theobald.

Hab. Punjab and Sind; also reeently found in the ruins of Nineveh.

Both this and the preeeding speeies are regarded as highly poisonous by the natives, and the name "Bis-Cobra" is often applied to them; (though more eommonly used for young *Varani*).

Family III. AGAMIDÆ.

Skull with bony postorbital and postfronto-squamosal arches, the first-named formed by the frontal and the jugal, the latter by the postfrontal and the squamosal; supratemporal fossa not roofed over; præmaxillary single; nasals distinct; parietal single; a fibro-cartilaginous interorbital septum; a columella cranii. Teeth anchylosed to the parapet of the jaws (Acrodont dentition), usually unequal in size or divisible into incisors, canines *, and molars;

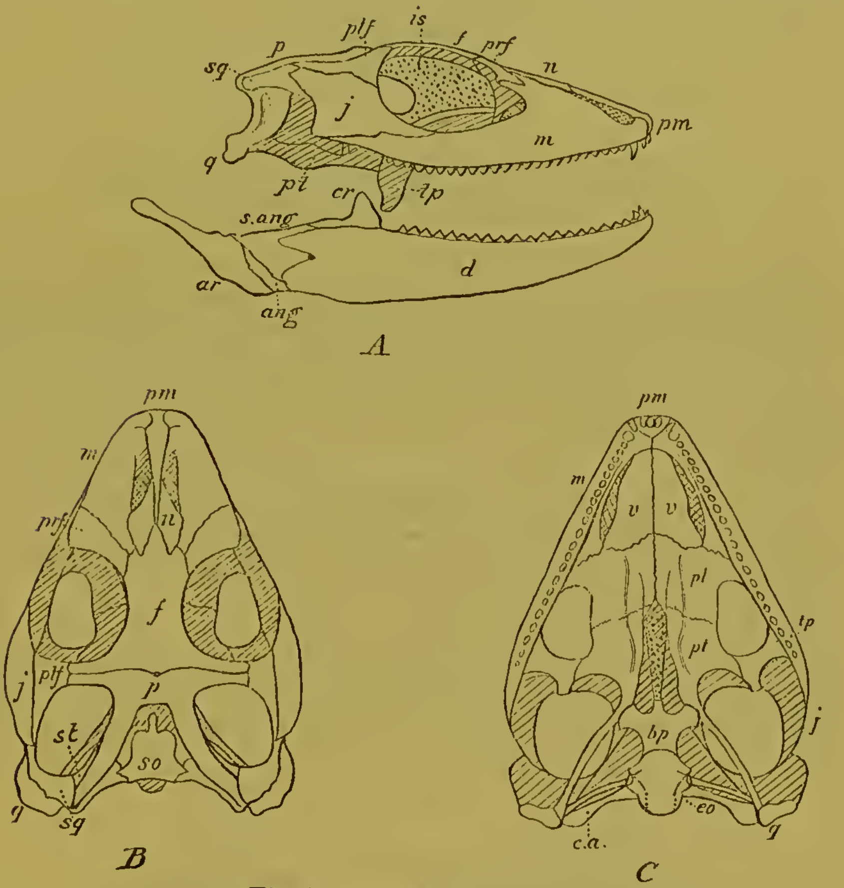


Fig. 34.—Skull of *Calotes jubatus*.

A. Side view.
ang. Angular.
ar. Articular.
bp. Basiphenoid.
cr. Coronoid.
d. Dentary.
eo. Exoccipital.
f. Frontal.
is. Interorbital septum.

B. Upper view.
j. Jugal.
m. Maxillary.
n. Nasal.
p. Parietal.
pl. Palatine.
pm. Præmaxillary.
prf. Præfrontal.
pt. Pterygoid.

C. Lower view.
ptf. Postfrontal.
q. Quadrate.
s.ang. Supra-angular.
so. Supraoccipital.
sq. Squamosal.
st. Supratemporal.
tp. Transpalatine.
v. Vomer.

* Canines are absent in *Uromastix*.

no teeth on the palate. No dermal ossifications on the head or body. Clavicle slender, not dilated; interclavicle T-shaped or anchor-shaped.

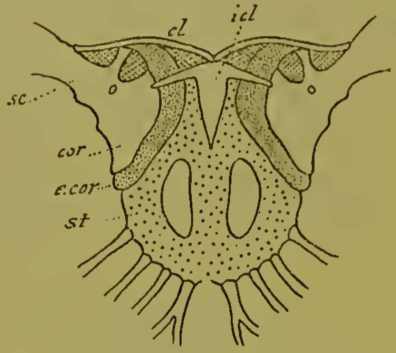


Fig. 35.—Pectoral arch of *Calotes jubatus*.
cl. Clavicle. *cor.* Coracoid. *icl.* Interclavicle. *st.* Sternum.
c.cor. Epicoracoid. *sc.* Scapula.

Tongue short or moderate, thick, not or but slightly nicked anteriorly, villose. Eye small, pupil round; eyelids well developed. Ear distinct or hidden. Scales usually imbricate; no symmetrical shields on the crown; ornamental appendages, such as crests, gular pouches, &c., frequently present. Limbs well developed. Femoral pores absent in most of the genera. Tail usually long and not fragile.

Agamoids are mostly oviparous. *Phrynocephalus* is reported to be ovoviviparous. Many of the Indian forms are arboreal, and exhibit to a remarkable degree the rapid changes of colour so well known in the Cameleons.

Members of this family inhabit Africa, Asia, Australia, and Polynesia; both the species and genera are most numerous in the Indian Region, of the Reptile fauna of which they, and especially the arboreal forms, form one of the typical features.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. No femoral pores.
- *a.* Ribs much prolonged, supporting a wing-like dermal expansion .... DRACO, p. 111.
- *b.* No wing-like lateral expansion.
  - *a′.* Body not depressed.
    - *a″.* Four toes only................ SITANA, p. 114.
    - *b″.* Five toes.
      - *α.* Tympanum hidden.
        - *α′.* Fifth toe short, not longer than first; no dorsal crest.. OTOCRYPTIS, p. 115.
        - *β′.* Three parallel longitudinal folds on each side of the middle of the throat, curved and converging backwards, forming a U-shaped figure.. PTYCTOLÆMUS, p. 116.

γ'. A dorsal crest; scales very large, subequal, irregular; tail prehensile............ Cophotis, p. 117.
δ'. No dorsal crest; a large rostral appendage, at least in the male.................... Ceratophora, p. 118.
ε'. A dorsal crest; a V-shaped gular fold; a bony supra-orbital arch.............. Lyriocephalus, p. 121.
ζ'. A dorsal crest; an oblique fold in front of the shoulder.... Japalura, p. 129.
β. Tympanum exposed.
α'. A strong fold across the throat .... Gonyocephalus, p. 122.
β'. No fold across the throat; dorsal scales unequal; no gular pouch.............. Acanthosaura, p. 124.
γ'. No fold across the throat; dorsal scales large, unequal; males with a gular pouch .. Salea, p. 131.
δ'. No fold, or a very feeble one, across the throat; dorsal scales equal .... Calotes, p. 132.
b'. Body more or less depressed.
a''. Typanum exposed; males without callous præanal scales .... Charasia, p. 144.
b''. Tympanum exposed; males with callous præanal scales .... Agama, p. 146.
c''. Tympanum concealed.......... Phrynocephalus, p. 152.
B. Femoral pores present.
a. Tail long, round, feebly depressed, covered with small, equal scales. Liolepis, p. 156.
b. Tail with whorls of large, spinose scales .... Uromastix, p. 157.

Genus DRACO,

Linn. Syst. Nat. i, p. 358, 1766.

Body depressed, with a large lateral wing-like membrane, folding like a fan, supported by the last five or six ribs which are

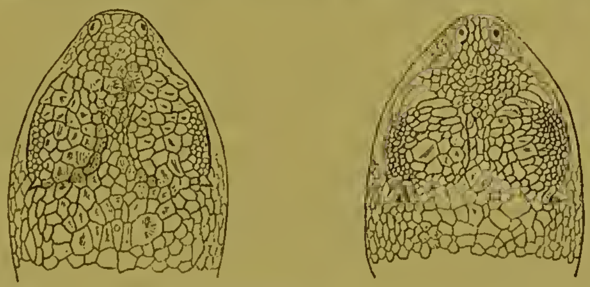


Fig. 36.—Heads of *Draco maculatus* and *Draco dussumieri*.

much produced. A gular appendage, and a lateral smaller one on each side. Tympanum distinct or covered with scales. Tail long. No femoral or præanal pores.

Distribution. The greater part of the Oriental region.

Synopsis of Indian and Burmese Species.

A. Nostrils lateral, directed outwards; tympanum covered with scales .... *D. maculatus*, p. 112.

B. Nostrils pierced vertically, directed upwards; tympanum naked.

a. The hind limb, stretched forwards, does not reach beyond the axil.

a′. Tympanum smaller than the eye-opening; wing-membranes above marbled with dark brown, with lighter spots and lines, immaculate below; male with a nuchal fold .... *D. blanfordii*, p. 112.

b′. Tympanum as large as the eye-opening; wing-membranes black above with round light spots, below with a series of large black spots near the margin .. *D. dussumieri*, p. 113.

b. The adpressed hind limb reaches beyond the axil. Wing-membranes above with 5 transverse black bands, below without markings .... *D. tæniopterus*, p. 113.

114. Draco maculatus.

Dracunculus maculatus, *Gray, Cat. Liz.* p. 236.
Draco maculatus, *Cantor, J. A. S. B.* xvi, 1847, p. 645; *Günth. Rept. B. I.* p. 125, pl. xiii, fig. C; *Theob. Cat.* p. 97; *Bouleng. Cat. Liz.* i, p. 262.

Head small; snout a little longer than the diameter of the orbit; nostril lateral, directed outwards; tympanum scaly. Upper head-scales unequal, strongly keeled; a compressed prominent scale on the posterior part of the superciliary region; 7 to 11 upper labials. The male's gular appendage very large, always much longer than the head, and frequently twice as long; female also with a well-developed but smaller gular sac. Male with a very small nuchal crest. Dorsal scales but little larger than the ventrals, irregular, smooth or very feebly keeled; on each side of the back a series of large trihedral keeled distant scales. The fore limb stretched forwards reaches beyond the tip of the snout; the adpressed hind limb reaches a little beyond the elbow of the adpressed fore limb, or to the axilla. Greyish above, with more or less distinct darker markings; a more or less distinct darker interorbital spot; wing-membranes above with numerous small round black spots, which are seldom confluent, beneath immaculate or with a few black spots; a blue spot on each side of the base of the gular appendage.

From snout to vent 3·25 inches; tail 4·5.

Hab. From Assam and Yunnan to Singapore.

115. Draco blanfordii.

Draco major (*non Laur.*), *Blanf. J. A. S. B.* xlvii, 1878, p. 125.
Draco blanfordii, *Bouleng. Cat. Liz.* i, p. 267, pl. xx, fig. 7.

Head small, snout constricted, slightly longer than the diameter of the orbit; nostril directed upwards, perfectly vertical; tympanum

naked, smaller than the eye-opening. Upper head-scales unequal, keeled; a prominent tubercle at the posterior corner of the orbit; 9 upper labials. The male's gular appendage longer than the head, very thin, covered with large scales. Male with a slight nuchal fold. Dorsal scales equal, smooth or very feebly keeled, not larger than ventrals; a series of widely separated enlarged keeled scales along side of back. The fore limb stretched forwards extends considerably beyond the tip of the snout; the adpressed hind limb nearly reaches the axil. Grey-brown above, with small dark spots; wing-membranes above marbled with dark brown, with lighter spots and lines, beneath immaculate; throat unspotted, greenish, pale scarlet beneath the lateral wattles.

From snout to vent 4·75 inches; tail 9. The largest species of the genus.

Hab. Tenasserim.

116. Draco dussumieri.

Draco dussumieri, *Dum. & Bibr. Erp. Gén.* iv, p. 456; *Günth. Rept. B. I.* p. 125, pl. xiii, fig. D; *Theob. Cat.* p. 97; *Bouleng. Cat. Liz.* i, p. 268.

Head small; snout constricted, as long as the diameter of the orbit; nostril directed upwards, perfectly vertical; tympanum naked, as large as the eye-opening. Upper head-scales unequal, keeled; a spinose conical scale at the posterior corner of the orbit; 9 to 12 upper labials, the last twice or thrice as large as the preceding. The male's gular appendage much longer than the head. Male with a slight nuchal fold. Dorsal scales scarcely larger than ventrals, unequal, smooth or very slightly keeled; on each side of the back a series of small tubercular prominences, each being composed of several small scales. The fore limb stretched forwards extends beyond the tip of the snout; the adpressed hind limb reaches the axil or not quite so far. Grey-brown above; a series of more or less distinct dark circles on the back; wing-membranes above purplish black, enclosing round light spots, below with a series of large black spots near the margin; throat with irregular dark spots.

From snout to vent 3 inches; tail 4·75.

Hab. Malabar, Cochin, Travancore, in forests and plantations of cocoa-nut and betel-nut palms. Peculiar to the low country near the west coast.

117. Draco tæniopterus.

Draco tæniopterus, *Günth. P. Z. S.* 1861, p. 187, *and Rept. B. I.* p. 126, pl. xiii, fig. E; *Theob. Cat.* p. 98; *Bouleng. Cat. Liz.* i, p. 269.

Head small; snout as long as the diameter of the orbit; nostril directed upwards, perfectly vertical; tympanum naked, smaller than the eye-opening. Upper head-scales unequal, strongly keeled; 6 to 9 upper labials. The male's gular appendage slightly longer

than the head, covered with very large scales. Male with a slight nuchal fold. Dorsal scales equal, very feebly keeled, not larger than ventrals; a more or less distinct lateral series of enlarged keeled distant scales. The fore limb stretched forwards extends considerably beyond the tip of the snout; the adpressed hind limb reaches beyond the axil. Greyish or brownish above, with metallic gloss, without distinct spots; wing-membranes above with 5 arched transverse black bands, about as wide as the interspaces between them; some of these bands may be forked at the base or enclose large light spots; wing-membranes uniform below.

From snout to vent 2·75 inches; tail 5·25.

Hab. Tenasserim and Siam.

Genus SITANA.

Cuvier, Règne An. 2nd ed. ii, p. 43, 1829.

Fig. 37.—Foot of *Sitana ponticeriana.*

Body slightly compressed, limbs long. Fifth toe absent. Scales all keeled, regular, smallest on the flanks. No dorsal crest. Male with a slight nuchal fold and a large folding gular appendage extending backwards to the belly and covered with large scales. No gular fold. Ear exposed. No præanal or femoral pores.

Distribution. India; Ceylon. A single species.

118. Sitana ponticeriana.

Sitana ponticeriana, *Cuv. Règne An.* ed. 2, ii, p. 43; *Günth. Rept. B. I.* p. 135; *Theob. Cat.* p. 102; *Bouleng. Cat. Liz.* i, p. 270.
Sitana minor, *Günth. l. c.* pl. xiv, fig. A.
Sitana deccanensis, *Jerdon, P. A. S. B.* 1870, p. 76.

Upper head-scales small, sharply keeled; canthus rostralis and supraciliary edge sharp, with much enlarged scales. Dorsal scales larger than ventrals, with sharp keels forming straight longitudinal lines; lateral scales smallest, uniform or intermixed with scattered enlarged ones. Limbs above with uniform strongly keeled scales. The length of the limbs varies very much: in some specimens the hind limb stretched forwards does not extend beyond the orbit, in others it reaches the end of the snout or even considerably beyond. Tail round, slender, once and a half to twice as long as the head and body, covered with equal keeled scales. Olive-brown above, with a series of rhomboidal spots along the middle of the back; a more or less distinct light band along each side of the back. Gular appendage tricoloured—blue, black, and red; this appendage

is more developed in the breeding-season, and in the majority of individuals, at all events, is not coloured at other times.

From snout to vent 3·2 inches; tail 4·6.

Hab. India from the base of the Himalayas to Cape Comorin, and from the Punjab and Cutch (not Sind) to Western Bengal; Ceylon.

Mr. Blanford, who has observed thousands of specimens, confirms Jerdon's statement that *Sitana* is purely a ground-lizard; it is found in open country as well as in woods.

Genus **OTOCRYPTIS,**

Wiegmann, Isis, 1831, p. 293.

Body compressed, limbs very long. Fifth toe very short, not longer than first. All the scales keeled, the dorsals heterogeneous. No dorsal crest. No gular fold. Male with a low nuchal crest and a large folding gular appendage extending backwards to the belly, and covered with large scales. Ear concealed. No præanal or femoral pores.

Fig. 38.
Foot of *Otocryptis beddomii.*

Distribution. Ceylon, Southern India. Two species.

This genus, as regards the structure of the foot, is intermediate between *Sitana*, in which the fifth toe is absent, and *Ptyctolæmus*, in which it is much elongate, as shown in figures 37, 38, and 39. In spite of its hidden tympanum, *Otocryptis* is, on the whole, more nearly allied to *Sitana* than to *Ptyctolæmus*.

Synopsis of the Species.

No pit at side of neck	*O. bivittata*, p. 115.
A pit at side of neck	*O. beddomii*, p. 116.

119. **Otocryptis bivittata.**

Otocryptis bivittata, *Wiegm. Isis*, 1831, p. 293; *Günth. Rept. B. I.* p. 127; *Theob. Cat.* p. 98; *Bouleng. Cat. Liz.* i, p. 271.

Upper head-scales sharply keeled; canthus rostralis and supraciliary edge sharp, with much enlarged scales; supraorbital scales large, the inner series forming, with some enlarged scales on the snout, a regular /\ -shaped figure; interorbital region with four or five longitudinal series of very small scales; 9 to 11 upper and as many lower labials. Dorsal scales unequal, the enlarged ones sometimes forming regular longitudinal series; lateral scales small,

with scattered enlarged ones; ventral scales larger than dorsals. Limbs covered with large subequal scales; the hind limb stretched forwards reaches far beyond the tip of the snout, the heel reaching the eye or the posterior border of the orbit. Tail round, slender, $2\frac{1}{2}$ times as long as head and body, covered with equal strongly keeled scales. Brownish olive above, sides darker; a dark-brown, light-edged cross band between the eyes, and more or less distinct dark cross bands along the middle of the back; generally a light oblique band from below the eye to the angle of the mouth; males generally with a light band along each side of the back; limbs and tail with more or less distinct dark cross bars; lower surfaces whitish, the throat brownish in the females and young.

From snout to vent 2·6 inches; tail 7.

Hab. Ceylon.

120. Otocryptis beddomii.

Otocryptis beddomii, *Bouleng. Cat. Liz.* i, p. 272, pl. xxiii, fig. 1.

Head-scales as in the preceding, but the interorbitals only a little smaller than the others, in two or three longitudinal series; the Λ-shaped figure formed by the keels of some of the scales generally indistinct; canthus rostralis less prominent; 9 or 10 upper and as many lower labials. A small pit on each side of the neck, in front of the shoulder. Dorsal scales unequal, the enlarged ones sometimes forming regular chevrons on the back, with the point directed backwards, or a lateral longitudinal series, the latter always distinct on the sacral region; lateral scales a little smaller, with scattered enlarged ones; ventral scales much larger than dorsals. Limbs above with large equal keeled scales; the hind limb stretched forwards reaches beyond the tip of the snout, the heel reaches the tympanum. Tail round, slender, not twice as long as head and body, covered with equal strongly keeled scales. Light brownish olive above, uniform, or with small scattered dark-brown spots on the back and limbs; a more or less distinct light dark-edged oblique band from below the eye to the mouth; lower surfaces whitish, the throat brownish in the young.

From snout to vent 1·75 inches; tail 3.

Hab. Sivagiri Ghát, Tinnevelly, S. India. Found on grass at an elevation of about 4300 feet.

Genus PTYCTOLÆMUS,

Peters, MB. Ak. Berl. 1864, p. 386.

Body compressed. Fifth toe much longer than first. All the scales keeled, the dorsals heterogeneous. No dorsal crest. Three parallel longitudinal folds on each side of the middle of the throat, curved and converging backwards, forming a U-shaped figure. Ear concealed. No præanal or femoral pores.

A single species.

121. Ptyctolæmus gularis.

Otocryptis (Ptyctolæmus) gularis, *Peters, MB. Ak. Berl.* 1864, p. 386.

Ptyctolæmus gularis, *Bouleng. Cat. Liz.* i, p. 273.

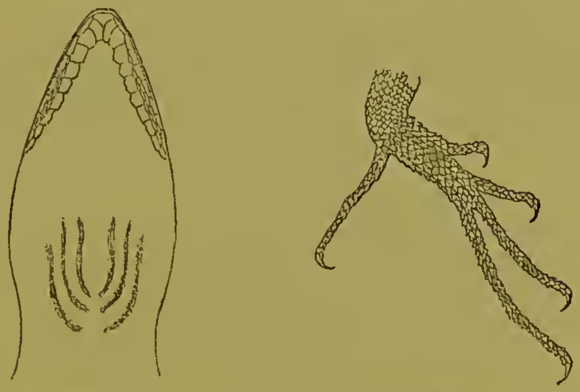


Fig. 39.—Throat and foot of *Ptyctolæmus gularis.*

Head rather elongate, the snout longer than the diameter of the orbit; canthus rostralis and supraciliary edge angular; upper head-scales unequal, keeled; 8 upper and as many lower labials. A slight indication of a nuchal crest (♀). Dorsal and lateral scales small, feebly keeled, with some irregularly scattered enlarged and strongly keeled; ventrals larger, strongly keeled. Limbs above with subequal scales; the hind limb stretched forwards reaches the posterior border of the orbit; fifth toe as long as third. Tail roundish, slender, a little more than twice as long as head and body, covered with subequal keeled scales. Olive-brown above, with darker transverse spots; two curved dark-brown cross bands, separated by a light one of equal width, between the eyes; an oblique dark-brown band from below the eye to the angle of the mouth; limbs and tail above with dark cross bands; the skin in the gular folds black.

From snout to vent 2·75 inches; tail 6·25.

Hab. Only two specimens of this lizard are known: the type in the Berlin Museum, which I have examined, said to be from Calcutta; the other, in the British Museum, is from Sadiya, in Assam.

Genus COPHOTIS,

Peters, MB. Ak. Berl. 1861, p. 1103.

Tympanum hidden. Body compressed, covered with large subequal irregular scales. A dorsal crest. A very small gular sac in both sexes; a slight transverse gular fold. Tail prehensile. No femoral or præanal pores.

Two species are known, one inhabiting Ceylon, the other Sumatra.

122. Cophotis ceylanica.

Cophotis ceylanica, *Peters, MB. Ak. Berl.* 1861, p. 1103; *Günth. Rept. B. I.* p. 132, pl. xiii, fig. H; *Theob. Cat.* p. 100; *Bouleng. Cat. Liz.* i, p. 275.

Snout nearly twice as long as diameter of orbit; upper head-scales rather large, unequal, tubercular; male with a small tubercle on the tip of the snout; 8 to 10 upper and as many lower labials; gular scales feebly keeled, smallest on the median line. Nuchal crest composed of 3 or 4 lanceolate spines, the longest of which about equals the diameter of the orbit; dorsal crest non-continuous with the nuchal, composed of 12 to 14 similar lobes separated from one another; in the female the lobes of the crest are shorter and not raised, but bent sideways on the back. Dorsal scales very large, irregular, imbricate, smooth or shortly keeled, the keels pointing downwards and backwards; ventral scales small, lanceolate, strongly keeled, mucronate. Scales on the limbs irregular, keeled, some slightly spinose; fingers and toes not very long, third slightly shorter than fourth; infradigital scales feebly keeled; the adpressed hind limb hardly reaches the axil. Tail feebly compressed, covered with keeled scales which are smaller beneath; its length is not once and a half that of head and body. Olive above, with irregular dark-brown cross bands; a light, reddish-brown to cream-coloured band from the end of the snout on the upper lip to above the shoulder; a cream-coloured spot on the nape and a cross band of the same colour on the anterior part of the back; lower lip with a broad dark-brown margin; more or less distinct oblique brown lines on the sides; tail with dark annuli.

From snout to vent 2·6 inches; tail 2·9.

Hab. Ceylon.

Genus CERATOPHORA,

Gray, Ill. Ind. Zool. ii, 1834.

Tympanum hidden. Body more or less compressed, covered with unequal scales. No dorsal crest; a nuchal crest present or absent. No gular sac; no gular fold. A large rostral appendage, at least in the males. No femoral or præanal pores.

Ceylon.

Synopsis of the Species.

a. Gular scales larger than the ventrals, smooth; lateral scales large, unequal; rostral appendage scaleless .... *C. stoddartii*, p. 119.

b. Gular scales larger than the ventrals, feebly keeled; lateral scales large, equal; rostral appendage scaly .... *C. tennentii*, p. 120.

c. Gular scales smaller than the ventrals, strongly keeled; lateral scales small; rostral appendage scaly .... *C. aspera*, p. 120.

123. Ceratophora stoddartii.

Ceratophora stoddartii, *Gray, Ill. Ind. Zool.* ii, pl. lxviii, fig. 2; *Kelaart, Prodr.* p. 165; *Günth. Rept. B. I.* p. 129, pl. xiii, fig. F; *Bouleng. Cat. Liz.* i, p. 277.
Lyriocephalus stoddartii, *Theob. Cat.* p. 99.

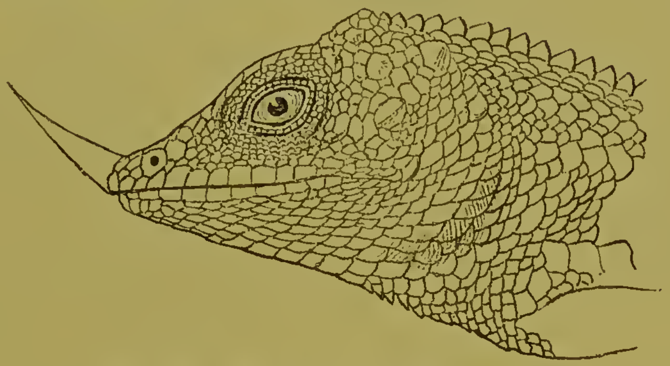


Fig. 40.—Head of *Ceratophora stoddartii.*

Upper head-scales small, irregular, keeled or tubercular; occiput concave, with a short raised ridge on each side; interorbital space concave; rostral appendage scaleless, flexible, pointed; its length varies considerably and it is short or entirely absent in the female; 10 to 12 upper and 9 or 10 lower labials. Gular scales smooth, large, subquadrangular, forming regular longitudinal series, those on the median line smaller. A low denticulated nuchal crest. Dorsal scales irregular and unequal in size, those on the sides large, strongly imbricate, and pointing upwards and backwards, intermixed with smaller ones; some of the dorsal scales feebly keeled, the others smooth; ventral scales small, smooth or feebly keeled. Limbs above with unequal keeled scales; the adpressed hind limb reaches the posterior border of the orbit or not quite so far. Tail slightly compressed, covered with equal keeled scales, intermixed with a few enlarged ones at the base; its length is once and two thirds to twice that of head and body. Olive above, with more or less distinct irregular darker cross bars on the back and limbs; frequently a white streak behind the orbit and a white spot or longitudinal band on the side of the neck; a white line along the hinder side of the thigh; rostral appendage and throat white (in spirit).

From snout to vent 3·25 inches; tail 6·7.

Hab. Ceylon (only the alpine parts).

124. Ceratophora tennentii.

Ceratophora tennentii, *Günth. in Tennent, Nat. Hist. Ceyl.* p. 281, fig.; *id. Rept. B. I.* p. 130; *Bouleng. Cat. Liz.* i, p. 278.
Lyriocephalus tennenti, *Theob. Cat.* p. 99.

Upper head-scales small, irregular, keeled; interorbital space and occiput slightly concave; a short raised ridge on each side of the occiput; rostral appendage large in both sexes, fleshy, compressed, suboval, covered with small scales and granules; 10 upper and 9 or 10 lower labials. Gular scales feebly keeled, large, subquadrangular, forming regular longitudinal series, those on the median line smaller. A low denticulated nuchal crest. Upper dorsal scales irregular and unequal in size, the larger ones feebly keeled; lateral scales equal, large, strongly imbricate, and pointing upwards and backwards, smooth or very feebly keeled; ventral scales smaller, keeled. Limbs above with subequal keeled scales; the adpressed hind limb reaches the eye or a little beyond. Tail slightly compressed, covered with equal keeled scales; its length not quite twice that of head and body. Olive above, irregularly marbled with brownish; young with more distinct brown markings, always with an angular cross band between the eyes, sometimes with light longitudinal lines; a more or less distinct white line along the hinder side of the thighs.

From snout to vent 3·5 inches; tail 6·7.

Hab. Ceylon.

125. Ceratophora aspera.

Ceratophora aspera, *Günth. Rept. B. I.* p. 131, pl. xiii, fig. G; *Bouleng. Cat. Liz.* i, p. 278.
Lyriocephalus asper, *Theob. Cat.* p. 100.

Upper head-scales small, irregular, tubercular; interorbital space deeply concave; occiput with a pair of low ridges, convergent anteriorly; rostral appendage large in the male, cylindrical, pointed, covered with small imbricate strongly keeled scales, absent or rudimentary in the female; 10 to 12 upper and as many lower labials. Gular scales smaller than ventrals, very strongly keeled. No nuchal crest. Dorsal scales small, irregular, unequal, strongly keeled; ventral scales larger, very strongly keeled. Limbs above with strongly keeled unequal scales; digits very strongly keeled; fifth toe shorter than third; the adpressed hind limb reaches between the shoulder and the orbit. Tail not compressed, covered with subequal strongly keeled scales; its length not more than 1½ times that of head and body. Brown, with lighter and darker markings or longitudinal lines; generally a rhombic mark on the sacral region; males with a large white spot or cross band on the gular region.

From snout to vent 1·75 inches; tail 1·8.

Hab. Ceylon.

Genus LYRIOCEPHALUS,

Merrem, Tent. Syst. Amph. p. 49, 1820.

Tympanum hidden. Body compressed, covered with small scales intermixed with enlarged ones. A nuchal and a dorsal crest. A gular sac and a V-shaped gular fold. Adult with a globular hump on the nose. No femoral or præanal pores.

Præ- and post-orbital bones forming an arch limiting a supra-orbital fossa.

Distribution. Ceylon.

Fig. 41.—Skull of *Lyriocephalus scutatus*, upper and side views.

126. Lyriocephalus scutatus.

Lacerta scutata, *Linn. Syst. Nat.* i, p. 360.
Lyriocephalus scutatus, *Kelaart, Prodr.* p. 166; *Günth. Rept. B. I.* p. 128; *Theob. Cat.* p. 99; *Bouleng. Cat. Liz.* i, p. 281.
Lyriocephalus macgregorii, *Gray, Ill. Ind. Zool.* ii, pl. lxviii, fig. 1.

Rostral hump large and globular in the adult, absent in the young, covered with subequal smooth scales; canthus rostralis and supraciliary edge sharp, projecting, the latter ending behind in a triangular compressed spine; a pair of small spines on the occiput; upper head-scales irregular, unequal, feebly keeled; temple granular, with enlarged tubercles; 14 or 15 upper and as many lower labials. Gular sac large in the male, small in the female; gular scales larger than ventrals, keeled, those on the gular sac separated by granules. Body strongly compressed. A low nuchal crest, formed of a cutaneous fold with small triangular scales forming a denticulation. Dorsal crest composed of small triangular compressed tubercles, separated from one another. Dorsal scales very small, smooth, intermixed with flat, smooth or feebly keeled tubercles which, on the nape, and sometimes also on the back, form regular longitudinal series; these tubercles irregularly

scattered on the flanks. Ventral scales moderate, strongly keeled. Limbs with keeled scales, with enlarged tubercles on the thighs; the adpressed hind limb reaches the neck or the temple. Tail strongly compressed, with a crest similar to the dorsal; upper caudal scales unequal, feebly keeled, lower equal and strongly keeled; the length of the tail nearly equals that of the head and body. Greenish above, whitish beneath.

From snout to vent 7 inches; tail 7.

Hab. The Kandian provinces.

Genus **GONYOCEPHALUS**,

Kaup, Isis, 1825, p. 590.

Tympanum distinct. Body compressed. Dorsal scales small, uniform or intermixed with enlarged ones. A dorsal crest. A strong transverse gular fold. Males with a gular sac. No præanal or femoral pores.

Distribution. East Indies, Papuasia, Polynesia, North-eastern Australia.

25 species are known, only four of which have to be dealt with in this work.

Synopsis of Indian and Burmese Species.

A. Ventral and gular scales keeled.
- *a.* Limbs above with subequal scales; longest spines of nuchal crest shorter than greatest diameter of tympanum .... *G. subcristatus*, p. 122.
- *b.* Limbs above with unequal scales; nuchal crest much higher than dorsal .... *G. humii*, p. 123.

B. Ventral scales keeled, gulars smooth........ *G. bellii*, p. 123.

C. Ventral and gular scales smooth............ *G. grandis*, p. 124.

127. **Gonyocephalus subcristatus.**

Tiaris subcristata, *Blyth, J. A. S. B.* xxix, 1861, p. 109; *Theob. Cat.* p. 112.

Gonyocephalus subcristatus, *Bouleng. Cat. Liz.* i, p. 292.

Snout longer than diameter of orbit; canthus rostralis and supraciliary edge sharp; tympanum nearly as large as eye-opening; upper head-scales of unequal size, strongly keeled; a few enlarged tubercles on back of head; 7 or 8 upper and as many lower labials. Gular sac very small; gular scales smaller than ventrals, keeled. Nuchal crest not continuous with dorsal, formed of triangular spines, the longest of which measures less than diameter of eye-opening, inserted on a slight fold of the skin; dorsal crest a serrated ridge. Dorsal scales small, keeled, the points directed upwards and backwards, a few scales enlarged, irregularly scattered; ventral scales rather small, strongly keeled. Limbs above with subequal keeled scales; third and fourth fingers equal; the adpressed hind limb

reaches the anterior border of the orbit, or between the latter and the nostril. Tail strongly compressed, with serrated upper edge, with keeled scales which are larger inferiorly; the length of the tail a little more than twice that of head and body. Brown or olive above, spotted or reticulated with black on the sides; sometimes a light, dark-edged band along each side of the back.

From snout to vent 3·25 inches; tail 8.

Hab. Andaman and Nicobar Islands.

128. Gonyocephalus humii.

Tiaris humei, *Stoliczka, J. A. S. B.* xlii, 1873, p. 167.
Gonyocephalus humii, *Bouleng. Cat. Liz.* i, p. 294.

Near *G. subcristatus*, but with the crest very much more developed; the nuchal crest considerably higher than the dorsal. General coloration greenish olive, on the top of the head brownish; sides of the entire body more or less distinctly and rather densely reticulated and spotted with black and yellow; sides of head and neck and the gular sac tinged with purplish blue, labials spotted with blue; chin mostly yellow.

Head and body 4·4 inches; tail 11.

Hab. Tillingchang Island, Nicobars. I have not seen examples of this species.

129. Gonyocephalus bellii.

Lophyrus bellii, *Dum. & Bibr. Erp. Gén.* iv, p. 416; *Peters, MB. Ak. Berl.* 1867, p. 16.
Gonyocephalus bellii, *Bouleng. Cat. Liz.* i, p. 288.

Tympanum nearly covered with scales. Upper head-scales small, keeled; two subconical tubercles on the occiput. Gular sac small, without serrated anterior edge; gular scales equal, smooth. Nuchal and dorsal crests continuous, commencing on the occiput; the crest is composed of lanceolate spines with two or three rows of smaller keeled spines on each side at its base, which gradually decrease in size on the back. Dorsal scales small, keeled, with the points turned upwards and backwards, intermixed with enlarged scales irregularly scattered; ventral scales strongly keeled. The adpressed hind limb reaches nearly the tip of the snout. Tail compressed, anteriorly with serrated upper edge; its length more than twice that of head and body. Brownish above, whitish-spotted; crest greenish grey; tail with regular dark annuli.

From snout to vent 6 inches; tail 13.

Hab. The type specimen in the Paris Museum was stated to be from Bengal. A second specimen has since been received by the Berlin Museum from Capt. von Orlich, together with other Reptiles from Bengal.

130. Gonyocephalus grandis.

Dilophyrus grandis, *Gray, Cat. Liz.* p. 239; *Cantor, J. A. S. B.* xvi, 1847, p. 640, pl. xx; *Günth. Rept. B. I.* p. 136; *Theob. Cat.* p. 103.
Gonyocephalus grandis, *Bouleng. Cat. Liz.* i, p. 298.

Snout longer than diameter of orbit; canthus rostralis and supraciliary edge sharp, projecting; tympanum nearly as large as eye-opening; upper head-scales very small, bluntly keeled, enlarged on the canthus rostralis and the supraciliary and supraorbital borders; one or two enlarged tubercles on each side behind the occiput; 10 to 12 upper and as many lower labials. Gular sac moderately large, without serrated anterior edge; gular scales smaller than ventrals, smooth. Nuchal and dorsal crests subcontinuous, separated by a deep notch, composed of long lanceolate spines united together, free only at the tips, with smaller triangular smooth spines at the base: in the male, the height of the nuchal crest nearly equals the length of the snout, and the dorsal crest is a little lower; in the female, the former is scarcely developed and the latter is reduced to a slight serration. Dorsal scales very small, with the points directed upwards and backwards; ventral scales rather small, smooth. Limbs above with equal smooth or very feebly keeled scales; third and fourth fingers equal; the adpressed hind limb reaches to between the eye and the tip of the snout. Tail strongly compressed, with sharp serrated upper edge; caudal scales smooth, with two rows enlarged and strongly keeled beneath; the length of the tail about $2\frac{1}{2}$ times that of head and body. Brown or olive above, with or without darker cross bands; flanks with roundish yellow spots; throat sometimes with blue lines.

From snout to vent 6 inches; tail 16.

Hab. Pegu, Malay Peninsula, Sumatra, Borneo. The occurrence of this species in Pegu strongly needs confirmation.

Genus **ACANTHOSAURA**,

Gray, Griff. A. K. ix, Syn. p. 56, 1831.

Tympanum distinct. Body generally compressed, limbs more or less elongate. Dorsal scales heterogeneous, small or moderate. A dorsal crest. No gular fold, but a more or less distinct oblique fold in front of the shoulder. No gular sac. No præanal or femoral pores.

Distribution. South-eastern Asia. 9 species are known.

Synopsis of Indian and Burmese Species.

A. Nuchal crest separated from dorsal.
- *a.* Spine between eye and tympanum nearly as long as diameter of orbit .... *A. armata,* p. 125.
- *b.* The spine not more than half diameter of orbit .... *A. crucigera,* p. 125.
- *c.* Postorbital spine $\frac{1}{3}$ to $\frac{2}{5}$ diameter of orbit.. *A. lamnidentata,* p. 126.

B. Nuchal and dorsal crests continuous.
 a. A spine on each side of neck .... *A. minor*, p. 127.
 b. No spine on side of neck.
  a'. Dorsal scales not very unequal in size .. *A. kakhienensis*, p. 127.
  b'. Dorsal scales very unequal in size...... *A. major*, p. 128.
  c'. A serrated ridge on each side of the neck, parallel with the nuchal ridge........ *A. tricarinata*, p. 129.

131. Acanthosaura armata.

Agama armata, *Gray, Zool. Journ.* iii, 1827, p. 216.
Acanthosaura armata, *Günth. Rept. B. I.* p. 148; *Theob. Cat.* p. 112 (?); *Bouleng. Cat. Liz.* i, p. 301, pl. xxii, fig. 1.

Snout as long as the diameter of the orbit, or slightly shorter; canthus rostralis and supraciliary edge angular; tympanum nearly as large as the eye-opening; upper head-scales keeled, much larger on the supraorbital region; a long spine, measuring from three fourths to one diameter of the orbit, terminates the supraciliary edge; 11 to 13 upper and 13 to 15 lower labials; gular scales strongly keeled, much smaller than the ventrals. An oblique fold on each side of the neck, in front of the shoulder; a large spine, of the same size as the postorbital, on each side of the nape above the tympanum. Nuchal crest not continuous with the dorsal, composed of large compressed spines, as long as the postorbital ones, with the base concealed by two or three rows of smaller spines. Dorsal crest anteriorly as high as the nuchal, becoming very low behind. Dorsal scales extremely small, all with the points directed upwards, intermixed with irregularly scattered, enlarged, rhomboidal, strongly keeled scales; ventral scales a little larger than the enlarged dorsals, strongly keeled. Fore limb and tibia above with equal keeled scales, femur with unequal ones; fourth finger very slightly longer than third; the hind limb stretched forwards reaches between the temple and the nostril. Tail compressed, $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as head and body, covered with uniform strongly keeled scales, which are larger beneath. Brownish above, with round lighter spots, or light with irregular dark spots; some dark lines radiate from the eye; an oblique dark brown band down each side of the neck, from the interruption between the nuchal and dorsal crests to the throat.

From snout to vent 5·4 inches; tail 6·25.

Hab. Tenasserim (?), Malay Peninsula, Siam, Cochin China.

132. Acanthosaura crucigera.

Acanthosaura crucigera, *Bouleng. Cat. Liz.* i, p. 302, pl. xxii, fig. 2.

Snout as long as diameter of orbit; canthus rostralis and supraciliary edge angular; tympanum smaller than eye-opening; upper head-scales rather feebly keeled, much larger on the supraorbital

region; a spine, measuring one half the diameter of the orbit, terminates the supraciliary edge; 9 or 10 upper and as many lower labials; gular scales strongly keeled, much smaller than the ventrals. An oblique fold down each side of the neck, in front of the shoulder; a spine, the length of which does not exceed one half the diameter of the orbit, on each side of the nape, above the tympanum. Nuchal crest not continuous with the dorsal, composed of large compressed spines a little longer than the postorbital ones, with the base concealed by two or three rows of smaller spines. Dorsal crest much lower than the nuchal, gradually decreasing in size, reduced posteriorly to a very feeble denticulation. Dorsal scales not quite so small as in *A. armata*, with the point directed upwards, intermixed with irregularly scattered, enlarged, rhomboidal, strongly keeled scales; ventral scales larger than the enlarged dorsals, strongly keeled. Fore limb and tibia above with equal keeled scales, femur with unequal ones; fourth finger very slightly longer than third; the adpressed hind limb reaches the anterior border of the orbit in the female, the end of the snout in the male. Tail compressed, nearly twice as long as head and body, covered with uniform strongly keeled scales, which are larger beneath. Pinkish grey above, with brown spots and marblings enclosing roundish light spots; a large cruciform dark-brown marking on the nape, the lateral branches descending along the antehumeral fold to the throat; eyelids and a streak from the end of the snout to the tympanum, through the orbit, dark brown; limbs and tail with dark and light cross bands.

From snout to vent 3·8 inches; tail 6·8.

Hab. Tenasserim.

133. Acanthosaura lamnidentata.

Acanthosaura lamnidentata, *Bouleng. Cat. Liz.* i, p. 302, pl. xxii, fig. 3.

Snout as long as diameter of orbit; canthus rostralis and supraciliary edge angular; tympanum a little smaller than eye-opening; upper head-scales keeled, larger on the supraorbital region; a spine, measuring $\frac{1}{3}$ to $\frac{2}{5}$ the diameter of the orbit, terminates the supraciliary edge; 10 or 11 upper and 11 or 12 lower labials; gular scales strongly keeled, smaller than the ventrals. An oblique fold down each side of the neck, in front of the shoulder; a spine a little shorter than the postorbital on each side of the nape above the tympanum. Nuchal crest not continuous with dorsal, composed of compressed triangular scales, the longest of which equal the postorbital spine; spines at base of nuchal crest small. Dorsal crest very low, formed of triangular scales, gradually decreasing in size behind, where it is reduced to a slight denticulation. Dorsal scales extremely small, with the points directed upwards, intermixed with irregularly scattered, enlarged, rhomboidal, strongly keeled scales; ventral scales larger than the enlarged dorsals, strongly keeled. Fore limb and tibia above with equal keeled

scales, femur with unequal ones; fourth finger very slightly longer than third; the adpressed hind limb reaches the eye or the nostril. Tail compressed, $1\frac{2}{3}$ or $1\frac{3}{4}$ times as long as head and body, covered with uniform strongly keeled scales, which are larger beneath. Brownish olive above, with roundish lighter spots, or with a series of large dark-brown spots on each side of the back; a large dark-brown marking on the nape, in some specimens becoming wider in front; hind limbs and tail with dark transverse bars.

From snout to vent 4·25 inches; tail 6·8.

Hab. Pegu and Tenasserim. Perhaps only a variety of the preceding.

134. Acanthosaura minor.

Calotes minor, *Gray, Cat. Liz.* p. 244.
Oriocalotes minor, *Günth. Rept. B. I.* p. 147.
Charasia minor, *Theob. Cat.* p. 113.
Acanthosaura minor, *Bouleng. Cat. Liz.* i, p. 304, pl. xxiii, fig. 2.

Snout a little longer than diameter of orbit; canthus rostralis and supraciliary edge angular; tympanum smaller than eye-opening; upper head-scales keeled, of very irregular size, enlarged on the supraorbital region; a small spine, measuring a little less than the vertical diameter of the tympanum, behind the supraciliary edge; two other similar spines on each side of the back of the head, the foremost nearly equally distant from the tympanum and the nuchal crest, the other just above the tympanum; 7 or 8 upper and as many lower labials. Gular scales a little smaller than the ventrals. An oblique fold on each side of the neck, in front of the shoulder. Nuchal and dorsal crests continuous, low, reduced to a serrated ridge on the back. Dorsal scales rather large, strongly keeled, the upper with the points directed obliquely upwards and backwards; some enlarged scales are scattered on the sides; ventral scales very strongly keeled, smaller than dorsals. Limbs above with subequal strongly keeled scales; fourth finger very slightly longer than third; the adpressed hind limb reaches between the neck-fold and the temple. Tail scarcely compressed, nearly twice as long as head and body, covered with uniform strongly keeled scales, which are not larger beneath. Pale brownish olive above, with irregular dark-brown spots or marblings, frequently forming irregular cross bands; several dark streaks radiate from the eye; throat with more or less distinct irregular dark transverse lines.

From snout to vent 2·9 inches; tail 5·8.

Hab. Sikhim and Khasi Hills.

135. Acanthosaura kakhienensis.

Oriocalotes kakhienensis, *Anders. An. Zool. Res. Yunnan,* p. 806, pl. lxxvi, fig. 1.
Acanthosaura kakhienensis, *Bouleng. Cat. Liz.* i, p. 305.

Canthus rostralis and supraciliary ridge not well defined; upper head-scales obtusely keeled, of different sizes; no spines on the head. A slight fold above and in front of the shoulder. Nuchal crest composed of six to eight triangular spines, disappearing a short way behind the shoulders. Dorsal scales of moderate size, keeled; those on the side of the back directed upwards and backwards, and those below downwards and backwards; a few large keeled scales scattered over the sides; scales of chest and belly of moderate size and strongly keeled. The hind limb extends to the angle of the jaw. Base of tail compressed, but thick and somewhat rounded. General colour above olive, irregularly variegated with brown and yellow, these colours having a tendency to arrange themselves in cross bands; a broad black band from the posterior margin of the eye to the tympanum; black streaks radiate from the eye; under surface olive-green.

Size of *A. major*.

Hab. Ponsee, Kakhyen Hills, N. Burma. I have not seen examples of this species.

136. Acanthosaura major.

Oriocalotes major, *Jerdon, P. A. S. B.* 1870, p. 77.
Charasia major, *Theob. Cat.* p. 113.
Acanthosaura major, *Bouleng. Cat. Liz.* i, p. 306, pl. xxiii, fig. 3.

Snout longer than diameter of orbit; canthus rostralis and supraciliary edge angular; tympanum a little larger than eye-opening; upper head-scales unequal, keeled, a series of larger ones bordering the supraorbital region inside; no postorbital spine; a row of projecting triangular scales borders the head behind; 7 upper and as many lower labials; gular scales smaller than ventrals, feebly keeled. A rather indistinct oblique fold in front of the shoulder. Nuchal and dorsal crest continuous, reduced to a serrated ridge. Dorsal scales very irregular, some very small, others very large; all are distinctly keeled, and the upper have their points directed upwards and backwards; ventral scales distinctly keeled, smaller than the largest dorsals. Limbs above with unequal keeled scales; fourth finger very slightly longer than third; the adpressed hind limb reaches the tympanum. Tail compressed, $1\frac{2}{3}$ times as long as head and body, covered with unequal keeled scales. Olive above; back with six large angular blackish cross bands, with the angles directed backward; flanks reticulated with blackish; head above with blackish cross streaks; an oblique black band from the eye to the tympanum, continued along the side of the neck; limbs and tail with dark cross bars.

From snout to vent 3·7 inches; tail 6.

Hab. Western Himalayas (Valley of the Sutlej, near Kotgarh).

137. Acanthosaura tricarinata.

Calotes tricarinatus, *Blyth, J. A. S. B.* xxii, 1854, p. 650.
Tiaris elliotti, *Günth. P. Z. S.* 1860, p. 151, pl. xxv, fig. B.
Oriotiaris elliotti, *Günth. Rept. B. I.* p. 150.
Charasia tricarinata, *Theob. Cat.* p. 114.
Acanthosaura tricarinata, *Bouleng. Cat. Liz.* i, p. 306.

Snout slightly longer than diameter of orbit; canthus rostralis and supraciliary edge angular; tympanum nearly as large as eye-opening; upper head-scales unequal, feebly keeled, a series of larger ones bordering the supraorbital region inside; a conical tubercle behind the supraciliary edge; an oblique transverse row of conical ribbed tubercles on each side, bordering the head behind; 5 or 6 upper and as many lower labials; gular scales smaller than ventrals, indistinctly keeled; a conical tubercle below the tympanum. Oblique fold in front of the shoulder very indistinct. Body not, or but very slightly, compressed. Nuchal and dorsal crests continuous, reduced to a series of enlarged strongly keeled scales; another parallel series of enlarged scales on each side of the nape, lost a short distance beyond the shoulder. Dorsal scales very irregular, scarcely imbricate, smooth or feebly keeled; strongly enlarged keeled scales are scattered on the flanks, and frequently others form angular series across the back; ventral scales as large as the enlarged dorsals, feebly keeled. Limbs above with unequal strongly keeled scales; fourth finger longer than third; the adpressed hind limb reaches the eye or the tip of the snout. Tail not compressed, twice to twice and a half as long as head and body, covered with rather unequal keeled scales. Brownish grey or blue above, uniform or with angular brown markings on the back; lateral nuchal denticulation brown-edged; lower surfaces uniform whitish or with small black dots.

From snout to vent 2 inches; tail 4·25.

Hab. Sikkim, up to 9200 feet.

Genus JAPALURA,

Gray, A. M. N. H. (2) xii, 1853, p. 387.

Tympanum hidden. Dorsal scales heterogeneous. A dorsal crest. Gular pouch small or absent. An oblique fold in front of the shoulder; gular fold present or absent. Tail feebly compressed. No præanal or femoral pores.

Distribution. East Indies; Southern China.

Of the 6 known species, one occurs in the Himalayas and Eastern Bengal, and another in the Khási Hills.

Synopsis of Indian Species.

Body compressed . . . . *J. variegata*, p. 130.
Body subquadrangular; back nearly flat . . . . . . *J. planidorsata*, p. 130.

138. Japalura variegata.

Japalura variegata, *Gray, A. M. N. H.* (2) xii, p. 388; *Günth. Rept. B. I.* p. 133; *Theob. Cat.* p. 101; *Bouleng. Cat. Liz.* i, p. 308, pl. xxiv, fig. 1.
Biancia niger, *Gray, l. c.* p. 387.
Japalura microlepis, *Jerdon, P. A. S. B.* 1870, p. 76.

Snout a little longer than diameter of orbit; canthus rostralis sharp; upper head-scales irregular, sharply keeled; a small tubercular scale behind the supraciliary edge; other scattered conical scales on the hind part of the head; 9 to 11 upper and as many lower labials. Male with a very small gular pouch. A well-developed nuchal crest. Body compressed, covered above and on the sides with small keeled scales intermixed with larger ones, all having their points obliquely directed upwards and backwards; dorsal crest a slight serrated ridge; ventral scales as large as the largest dorsals, strongly keeled. Limbs above with scales of irregular size; third and fourth fingers nearly equal; fifth toe not quite so long as third; the adpressed hind limb reaches the eye; tibia shorter than the skull. Tail compressed, slender, $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as head and body, covered above with unequal scales, beneath with equal larger ones, the size of which does not exceed that of the ventrals; all the caudal scales keeled. Olive-brown above, generally with alternating broad dark and narrower light chevron-shaped bands on the body; flanks reticulated; a more or less distinct light band on the upper lip and along each side of the neck; tail with dark annuli; middle of the throat generally black.

From snout to vent 4·3 inches; tail 8.

Hab. Sikhim and Eastern Bengal.

139. Japalura planidorsata.

Japalura planidorsata, *Jerdon, P. A. S. B.* 1870, p. 76; *Theob. Cat.* p. 102; *Bouleng. Cat. Liz.* i, p. 311, pl. xxiv, fig. 2.

Snout not or scarcely longer than diameter of orbit; canthus rostralis sharp; upper head-scales irregular, sharply keeled, the largest on the supraorbital region; a few conical scales on the hinder border of the head; 9 or 10 upper and as many lower labials. Body subquadrangular, the back being plane, bordered by a slight ridge of enlarged scales on each side; dorsal and lateral scales very irregular, keeled, intermixed with enlarged ones which on the back form 5 angular transverse series, with the angle directed backwards; a very slight serrated vertebral ridge; ventral scales as large as the largest dorsals, strongly keeled. Limbs above with scales of irregular size; fourth finger longer than third; fifth toe as long as third; the adpressed hind limb reaches the eye or a little beyond the tip of the snout; tibia as long as, or slightly

shorter than, the skull. Tail slightly compressed, above with unequal scales, beneath with equal larger ones, the size of which does not exceed that of the ventrals; all the caudal scales keeled. Olive-brown above, flanks darker; a band on the upper lip, whitish.

From snout to vent 1·9 inches.

Hab. Khási Hills.

Genus SALEA,

Gray, Cat. Liz. p. 242, 1845.

Tympanum distinct. Body compressed, covered with unequal-sized imbricate keeled scales. Male with a dorso-nuchal crest and a gular sac. No transverse gular fold. Tail compressed. No femoral or præanal pores.

Distribution. Southern India; living on trees.

Synopsis of the Species.

No fold in front of the shoulder .... *S. horsfieldii*, p. 131.
A fold in front of the shoulder .... *S. anamallayana*, p. 132.

140. Salea horsfieldii.

Salea horsfieldii, *Gray, Cat. Liz.* p. 242; *Günth. Rept. B. I.* p. 145; *Theob. Cat.* p. 111; *Bouleng. Cat. Liz.* i, p. 312.
Salea jerdonii, *Gray, A. M. N. H.* xviii, 1846, p. 429; *Kelaart, Prodr.* p. 167 (?).

Snout not more than once and a half as long as diameter of orbit, which equals about twice that of tympanum; upper head-scales large, rugose, with a more or less marked curved series of regular ones bordering the supraorbital region internally; a row of 3 or 4 enlarged scales from the eye to above the tympanum. Gular scales lanceolate, keeled, ending in a spine, as large as or a little larger than the ventrals. No fold in front of the shoulder. Nuchal crest in the male composed of a few lanceolate spines directed backwards, the longest measuring nearly the length of the snout, with smaller spines at the base; in the female this crest is reduced to a double row of alternate oblique short spines; dorsal crest not continuous with nuchal, composed of similar slightly shorter lanceolate spines in the male, absent in the female. Dorsal scales large, rhomboidal, strongly keeled, pointing straight backwards; they are nearly always of unequal size, larger ones being scattered on the sides; ventral scales very strongly imbricate, strongly keeled and ending in a spine, nearly as large as the dorsals. Limbs moderately elongate, the adpressed hind limb reaching between the shoulder and the tympanum. Tail compressed and with a small upper crest in the male, scarcely compressed and without a crest in the female; caudal scales subequal,

strongly keeled. Pale olive above, with irregular dark-brown cross bands, which may be broken up by a band of the light-brown colour running along each side of the back; the enlarged scales on the sides frequently white; a blackish band, edged below with white, extends from the eye to the fore limb, passing through the tympanum; tail usually with regular dark-brown annuli.

From snout to vent 3·75 inches; tail 9·75.

Hab. Nilgiri Hills, Southern India; Ceylon?

141. Salea anamallayana.

Lophosalea anamallayana, *Beddome, P. Z. S.* 1878, p. 153, pl. xiv.
Salea anamallayana, *Bouleng. Cat. Liz.* i, p. 313.

Snout long, measuring nearly twice the diameter of the orbit; tympanum $1\frac{2}{3}$ to $1\frac{3}{5}$ the diameter of the orbit; upper head-scales rather large, feebly keeled, with a regular curved series of enlarged scales bordering the supraorbital region internally; an enlarged tubercle behind the supraciliary edge and a few others scattered on the back of the head; a row of 3 or 4 enlarged scales from the eye to above the tympanum. Gular scales a little larger than ventrals, smooth or keeled. A well-marked curved fold on each side of the neck, in front of the shoulder. Dorso-nuchal crest continuous, composed of large lanceolate spines. Dorsal scales of unequal size, their arrangement varying considerably, strongly keeled, the upper ones pointing upwards and backwards, the others straight backwards or backwards and downwards; ventral scales very strongly imbricate, strongly keeled, and ending in a spine. The adpressed hind limb reaches the neck. Tail strongly compressed, in its anterior half with an upper crest nearly as much developed as the dorsal; caudal scales rather unequal in size, keeled. Pale olive above, with 4 broad angular dark-brown cross bands on the back, separated by narrow interspaces; head to the lip dark brown, with small light spots; limbs and tail with more or less regular dark-brown cross bars.

From snout to vent 4·3 inches.

Hab. Animalai (6000 feet) and Palni Hills.

Genus CALOTES,

Cuvier, Règne An. ii, p. 35, 1817.

Tympanum distinct. Body compressed, covered with equal-sized scales. A dorso-nuchal crest. A more or less developed gular sac in the male; no transverse gular fold, or a very feebly marked one. Tail round or feebly compressed. No femoral or præanal pores.

An essentially East-Indian genus, comprising 22 species, of arboreal or subarboreal habits.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. No fold in front of the shoulder.
  a. Lateral scales pointing backwards and downwards.
    a'. Upper dorsal scales pointing backwards, larger than ventrals .... *C. microlepis*, p. 134.
    b'. Upper dorsal scales pointing backwards and upwards, smaller than ventrals .... *C. cristatellus*, p. 134.
    c'. Only the scales of the row at the base of the dorsal crest point upwards .. *C. jubatus*, p. 135.
  b. Lateral scales pointing backwards and upwards.
    a'. 35 to 47 scales round middle of body; tympanum at least half diameter of orbit .... *C. versicolor*, p. 135.
    b'. 53 to 61 scales round middle of body; tympanum not quite one third diameter of orbit .... *C. maria*, p. 136.

B. An oblique fold or pit covered with small granular scales in front of shoulder, not extending across throat.
  a. Dorsal scales larger than ventrals, keeled.
    a'. Two serrated parallel ridges on each side of back of head; colour green.. *C. jerdonii*, p. 137.
    b'. A long spine behind supraciliary edge, and two others above ear.......... *C. emma*, p. 137.
    c'. No postorbital spine; a few small spines above ear .... *C. mystaceus*, p. 138.
  b. Dorsal scales larger than ventrals, smooth or nearly so.
    a'. Lateral scales pointing upwards and backwards; 29 to 35 scales round middle of body .... *C. grandisquamis*, p. 138.
    b'. Lateral scales pointing upwards and backwards; 37 to 43 scales round middle of body .... *C. nemoricola*, p. 139.
    c'. Lateral scales pointing upwards and backwards, or straight backwards; 60 scales round middle of body .... *C. ceylonensis*, p. 139.
    d'. Lateral scales pointing downwards and backwards .... *C. liolepis*, p. 140.
  c. Dorsal scales of same size as ventrals or smaller.
    a'. Lateral scales pointing upwards and backwards .... *C. ophiomachus*, p. 140.
    b'. Lateral scales pointing downwards and backwards; ventrals much larger than dorsals .... *C. nigrilabris*, p. 141.
    . Lateral scales pointing downwards and backwards; no spines whatever on head .... *C liocephalus*, p. 141.

C. A long oblique or curved fold in front of shoulder, extending across throat or nearly so.
- *a.* Two slender spines on each side of back of head.
  - *a'.* No spine at posterior corner of orbit. . *C. rouxii*, p. 142.
  - *b'.* A small slender spine behind supraciliary edge .... *C. ellioti*, p. 142.
- *b.* No slender spines on head .... *C. feæ*, p. 143.

A species named by Blyth *Salea gularis*, J. A. S. B. xxii, 1853, p. 473, footnote, from Mirzapur (?), probably belongs to this genus, but is not recognizable from the description.

142. Calotes microlepis.

Calotes microlepis, *Bouleng. Ann. Mus. Genova*, (2) v, 1887, p. 476, pl. vi, fig. 1.

Head narrow, twice as long as broad, deeper than broad, covered with unequal-sized, juxtaposed, feebly keeled scales, without tubercles or spines; tympanum not quite half the diameter of the orbit. Gular pouch not developed; gular scales feebly keeled, a little larger than ventrals. No fold in front of the shoulder. Nuchal crest composed of small spines; dorsal crest a slightly serrated ridge. 65 scales round the middle of the body, all keeled, upper dorsals largest and directed backwards, laterals directed downwards and backwards. The hind limb reaches the axilla; third and fourth fingers equal, about as long as the fifth toe. Tail slightly compressed. Orange above, golden yellow on the sides and below; sides with black specks; black lines radiate from the eye, two of which are prolonged, the upper to the tympanum, the lower to the commissure of the mouth.

From snout to vent 2·6 inches; tail 6.

Hab. Pla-pu, Mountains of Northern Tenasserim, 3300–3600 feet.

143. Calotes cristatellus.

Agama cristatella, *Kuhl*, *Beitr. Zool. vergl. Anat.* p. 108.
Bronchocela cristatella, *Günth. Rept. B. I.* p. 138; *Theob. Cat.* p. 104.
Bronchocela moluccana (*non Less.*), *Theob. l. c.*
Bronchocela burmana, *Blanf. J. A. S. B.* xlvii, 1878, p. 127.
Calotes cristatellus, *Bouleng. Cat. Liz.* i, p. 316.

Upper head-scales rather small, keeled, slightly enlarged on supraorbital region; a few more or less distinct, erect, compressed scales behind the supraciliary edge; tympanum half, or more than half, the diameter of the orbit. Gular pouch very small; gular scales keeled, smaller than ventrals, distinctly larger than laterodorsals. No oblique fold in front of the shoulder. Nuchal crest composed of erect compressed spines, the longest never equalling

the diameter of the orbit; dorsal crest a mere serrated ridge. 57 to 97 scales round the middle of the body; dorsal scales keeled, much smaller than ventrals, the upper ones directed upwards and backwards, the others downwards and backwards. The adpressed hind limb reaches between the eye and the tip of the snout; third and fourth fingers equal or nearly so, about as long as the fifth toe. Tail round, subtriangular at the base. Green, uniform or with reddish markings.

From snout to vent 4·8 inches; tail 15.

Hab. Malay Archipelago and Peninsula as far north as Tenasserim.

144. Calotes jubatus.

Bronchocela jubata, *Dum. & Bibr. Erp. Gén.* iv, p. 397; *Günth. Rept. B. I.* p. 139; *Theob. Cat.* p. 104.
Calotes jubatus, *Bouleng. Cat. Liz.* i, p. 318.

Upper head-scales moderate, keeled, not enlarged on supraorbital region; a few erect compressed scales behind the supraciliary edge; tympanum half or more than half the diameter of the orbit. Gular pouch well developed; gular scales keeled, smaller than the ventrals. No oblique fold in front of the shoulder. Nuchal crest large, composed of falciform spines directed backwards, the longest equalling or exceeding the diameter of the orbit, with several irregular rows of smaller spines at the base; dorsal crest well developed, though much less so than the nuchal, gradually decreasing in size towards the posterior part of the body. 43 to 53 (exceptionally 65) scales round the middle of the body; dorsal scales keeled, smaller than the ventrals; the scales of the row contiguous to the dorsal crest point upwards and backwards, those of the next row point straight backwards, all the others backwards and downwards. The adpressed hind limb reaches between the eye and the tip of the snout; third and fourth fingers equal, about as long as the fifth toe. Tail round, subtriangular, and with slight upper ridge at the base. Green, generally with yellow or reddish spots and short bands.

From snout to vent 5 inches; tail 17.

Hab. Malay Archipelago, Nicobars.

145. Calotes versicolor.

Agama versicolor, *Daud. Rept.* iii, p. 395, pl. xliv.
Calotes versicolor, *Kelaart, Prodr.* p. 170; *Günth. Rept. B. I.* p. 140; *Theob. Cat.* p. 109; *Bouleng. Cat. Liz.* i, p. 321.
? Calotes viridis, *Gray, A. M. N. H.* xviii, 1846, p. 429; *Theob. Cat.* p. 110.

Upper head-scales rather large, smooth or feebly keeled, imbricate, more or less enlarged on supraorbital region; two well-separated spines (seldom absent or scarcely distinct) on each side of the back of the head, above the ear; tympanum half, or less than half, the diameter of the orbit. Gular pouch not developed; gular

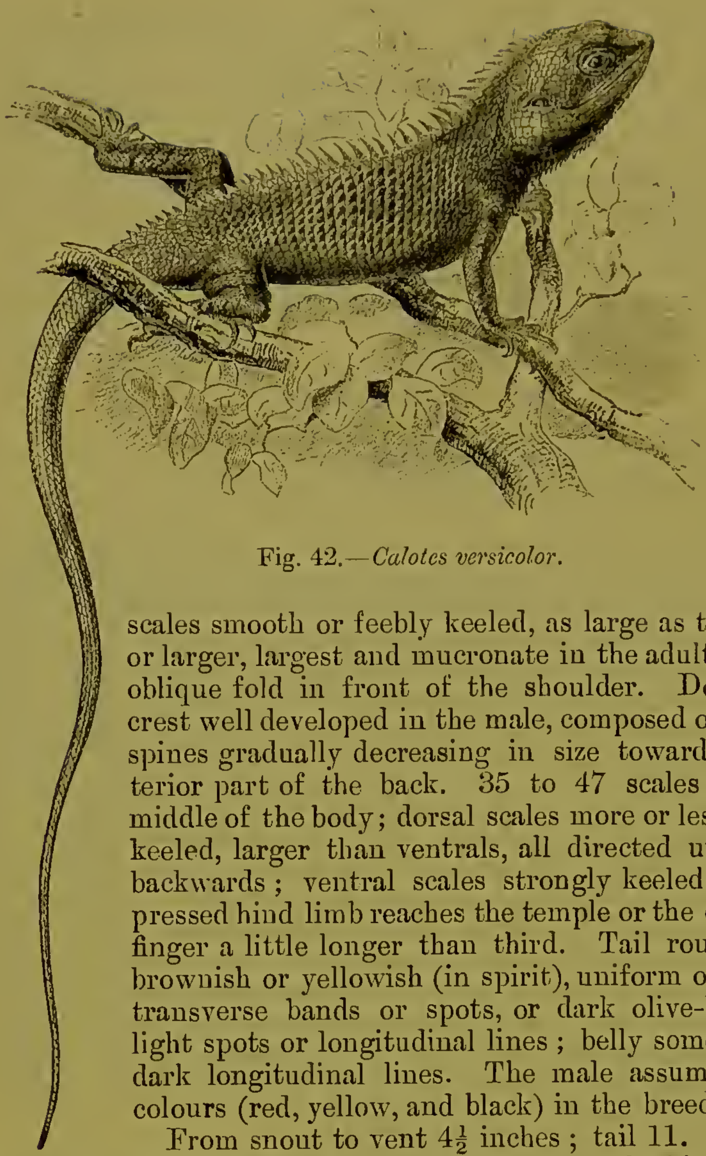


Fig. 42.—*Calotes versicolor.*

scales smooth or feebly keeled, as large as the ventrals or larger, largest and mucronate in the adult male. No oblique fold in front of the shoulder. Dorso-nuchal crest well developed in the male, composed of lanceolate spines gradually decreasing in size towards the posterior part of the back. 35 to 47 scales round the middle of the body; dorsal scales more or less distinctly keeled, larger than ventrals, all directed upwards and backwards; ventral scales strongly keeled. The adpressed hind limb reaches the temple or the eye; fourth finger a little longer than third. Tail round. Light brownish or yellowish (in spirit), uniform or with dark transverse bands or spots, or dark olive-brown with light spots or longitudinal lines; belly sometimes with dark longitudinal lines. The male assumes brilliant colours (red, yellow, and black) in the breeding-season.

From snout to vent $4\frac{1}{2}$ inches; tail 11.

Hab. Ceylon, India, eastwards to Tenasserim, Cochin China, and Southern China, westwards to Afghanistan and Baluchistan. Very common throughout India.

146. Calotes maria.

Calotes maria, part., *Gray, Cat. Liz.* p. 243; *Günth. Rept. B. I.* p. 144.
Calotes platyceps, *Blyth, J. A. S. B.* xxi, 1852, p. 354; *id. Kelaart, Prodr., App.* p. 46.
Calotes maria, *Günth. P. Z. S.* 1870, p. 778, pl. xlv, fig. B; *Theob. Cat.* p. 108; *Bouleng. Cat. Liz.* i, p. 322.

Upper head-scales rather large, smooth or feebly keeled, imbricate, very slightly enlarged on supraorbital region; two parallel longitudinal series of enlarged erect scales, terminating in long spines,

above the temple, the lower series separated from the tympanum by several rows of scales; tympanum very small, measuring less than one third the diameter of the orbit. Gular pouch not developed; gular scales strongly keeled, larger than ventrals, not larger than dorsals. No oblique fold in front of the shoulder. Dorso-nuchal crest well developed anteriorly, the longest spines measuring nearly two thirds the diameter of the orbit, gradually decreasing in size and reduced to a feebly serrated edge on the posterior half of the back. 53 to 61 scales round the middle of the body; dorsal scales feebly keeled, all directed upwards and backwards; ventral scales much smaller than dorsals, strongly keeled. The adpressed hind limb reaches the anterior border of the orbit, or between the latter and the nostril; third and fourth fingers nearly equal. Tail round. Green, with a few light (red) markings constantly present on the limb-joints.

From snout to vent 4·5 inches; tail 14·5.

Hab. Khási hills.

147. Calotes jerdonii.

Calotes maria, part., *Gray, Cat. Liz.* p. 243; *Günth. Rept. B. I.* p. 144.

Calotes platyceps (*non Blyth*), *Jerdon, P. A. S. B.* 1870, p. 77.

Calotes jerdonii, *Günth. P. Z. S.* 1870, p. 779, pl. xlv, fig. A; *Theob. Cat.* p. 108; *Bouleng. Cat. Liz.* i, p. 323.

Upper head-scales rather large, smooth or feebly keeled, imbricate, very slightly enlarged on supraorbital region; two parallel longitudinal series of enlarged erect scales on the temple, forming serrated ridges, not terminating in spines; the lower serrated ridge separated from the tympanum by one or two rows of scales; tympanum not quite half the diameter of the orbit. Gular pouch not developed; gular scales strongly keeled, larger than dorsals. A strong oblique fold or pit in front of the shoulder. Dorso-nuchal crest very low, the longest spines (on the nape) equalling about the diameter of the tympanum. 47 to 55 scales round the middle of the body; dorsal scales feebly keeled, all directed upwards and backwards; ventral scales much smaller than dorsals, strongly keeled. The adpressed hind limb reaches the eye, or between the latter and the nostril; fourth finger a little longer than third. Tail round. Green, uniform, or with light (red) markings, which may form a longitudinal lateral band; frequently black lines radiate from the eye; the fold on the side of the neck black.

From snout to vent 3·5 inches; tail 10·5.

Hab. Khási hills. The supposed occurrence of this species in the Himalayas needs confirmation.

148. Calotes emma.

Calotes emma, *Gray, Cat. Liz.* p. 244; *Günth. Rept. B. I.* p. 144; *Theob. Cat.* p. 108; *Bouleng. Cat. Liz.* i, p. 324, pl. xxv, fig. 1.

Upper head-scales imbricate, keeled, considerably enlarged on supraorbital region; a long spine surrounded by small ones behind the supraciliary edge, and two others on each side between the tympanum and the nuchal crest; the posterior spine smallest, and situated just above the tympanum, which measures half the diameter of the orbit. Gular pouch not developed; gular scales keeled, as large as ventrals or a little larger. A very strong oblique curved fold in front of the shoulder. Nuchal crest composed of long lanceolate spines, soon decreasing in size, the dorsal crest being reduced to a feebly serrated ridge. 51 to 55 scales round the middle of the body; dorsal scales keeled, all directed upwards and backwards; ventral scales smaller than dorsals, strongly keeled. The adpressed hind limb reaches the eye; third and fourth fingers nearly equal. Tail slightly compressed. Light brownish olive above, with transverse dark-brown bands on the back, which are interrupted by a more or less strongly defined light lateral band; black lines radiating from the eye; the fold in front of the arm black.

From snout to vent 3·5 inches; tail 9·5.

Hab. Khási and Kakhyen Hills, Pegu, Tenasserim, Mergui.

149. Calotes mystaceus.

Calotes mystaceus, *Dum. & Bibr. Erp. Gén.* iv, p. 408; *Blyth, J. A. S. B.* xxi, 1852, p. 354; *id. Kelaart, Prodr., App.* p. 47; *Günth. Rept. B. I.* p. 141; *Theob. Cat.* p. 106; *Bouleng. Cat. Liz.* i, p. 325.

? Calotes gigas, *Blyth, J. A. S. B.* xxii, 1853, p. 648.

Upper head-scales smooth or feebly keeled, imbricate, scarcely enlarged on supraorbital region; a few small spines on each side of the head above the tympanum; latter measuring at least half the diameter of the orbit. Gular sac small; gular scales feebly keeled, as large as dorsals. An oblique fold in front of the shoulder. Dorso-nuchal crest well developed in the male, composed of falciform spines directed backwards, the longest measuring the diameter of the orbit; it gradually decreases in height on the back, being reduced to a mere denticulation on the sacrum. 45–53 scales round the middle of the body; dorsal scales keeled, nearly twice as large as ventrals, all directed upwards and backwards; ventral scales strongly keeled. The adpressed hind limb reaches the tympanum or the posterior border of the orbit; fourth finger slightly longer than the third. Tail a little compressed, at the base with a slightly serrated upper ridge. Olive above, frequently with large transverse red spots on the back; lips yellowish.

From snout to vent 5 inches; tail 10.

Hab. Burma generally, Siam, Nicobars, Ceylon.

150. Calotes grandisquamis.

Calotes grandisquamis, *Günth. P. Z. S.* 1875, p. 226, pl. xxx; *Bouleng. Cat. Liz.* i, p. 325.

Upper head-scales smooth or very feebly keeled, imbricate, enlarged on supraorbital region; 3 or 4 small spines above tympanum; the latter measuring half diameter of orbit. A gular pouch; lateral gular scales larger than ventrals, smooth. A short oblique fold in front of the shoulder. Dorso-nuchal crest formed of large lanceolate spines, the longest of which (in the male) equals the diameter of the orbit, gradually decreasing in height on the back; in the female the dorsal crest is reduced to a very feebly serrated ridge. 29 to 35 scales round the middle of the body; dorsal scales nearly four times as large as ventrals, smooth, pointing backwards and upwards; ventral scales strongly keeled. The adpressed hind limb reaches the tympanum or slightly beyond; third and fourth fingers equal. Tail compressed. Green, uniform or with broad black transverse bands on the back; an orange spot may be present in the centre of each scale within the black bands.

From snout to vent 5·5 inches; tail 12·5.

Hab. Malabar (foot of Canoot Ghat, near Manantoddy).

151. Calotes nemoricola.

Calotes nemoricola, *Jerdon, J. A. S. B.* xxii, 1853, p. 471; *Theob. Cat.* p. 105; *Bouleng. Cat. Liz.* i, p. 326.

Upper head-scales feebly keeled, imbricate, enlarged on supraorbital region; 3 or 4 very small spines above the tympanum; latter measuring not quite half diameter of orbit. A gular pouch; gular scales larger than ventrals, very feebly keeled. A short oblique fold in front of the shoulder. Nuchal crest formed of large lanceolate spines, the largest of which measure three fourths the diameter of the orbit; dorsal crest a mere serrated ridge. 37 to 43 scales round the middle of the body; dorsal scales three times as large as ventrals, squarish, smooth, pointing backwards and upwards; ventral scales strongly keeled. The adpressed hind limb hardly reaches the tympanum; third and fourth fingers equal. Tail compressed. Olive above, with indistinct darker markings; a black streak from the eye to above the tympanum; dark lines radiating from the eye; gular sac pink (in spirit).

From snout to vent 5·5 inches; tail 12·5.

Hab. Base of Coonoor Ghat, Nilgiris; Malabar.

152. Calotes ceylonensis.

Calotes mystaceus, var. ceylonensis, *F. Müller, Verh. Naturf. Ges. Basel*, viii, 1887, p. 292, pl. iii.
Calotes kelaartii, *Nevill, Taprobanian*, ii, 1887, p. 134.

Upper head-scales smooth, imbricate, considerably enlarged on the supraorbital region; two small spines on each side above the tympanum; diameter of the tympanum half that of the orbit. No gular sac; gular scales very strongly keeled, much smaller than dorsals. A few small spines form a short nuchal crest; no dorsal

crest. 60 scales round the middle of the body, dorsals largest and smooth or indistinctly keeled; on the anterior half of the body the scales point upwards and backwards, on the hinder half nearly straight backwards; ventrals two thirds the size of dorsals, mucronate. The hind limb reaches the posterior border of the orbit. Greenish, with six large orange spots across the back, separated by dark bands; sides with a black network; black lines radiate from the eye.

Hab. Ceylon.

153. Calotes liolepis.

Calotes liolepis, *Bouleng. Cat. Liz.* i, p. 326, pl. xxv, fig. 2.

Upper head-scales smooth, imbricate, strongly enlarged on supraorbital region; two distinct spines on each side of the back of the head, between the ear and the nuchal crest; diameter of the tympanum nearly half that of the orbit. Gular sac not developed (♀); gular scales strongly keeled, as large as ventrals. A short oblique fold in front of the shoulder. Nuchal crest formed of narrow separated spines, the longest of which measure about the diameter of the tympanum; dorsal crest quite indistinct. 35 to 39 scales round the middle of the body; dorsal scales three times as large as ventrals, squarish, smooth, pointing backwards and downwards; ventral scales strongly keeled. The adpressed hind limb hardly reaches the tympanum; third and fourth fingers equal. Tail round. Pale olive, with indistinct brown transverse bands on the back; brown lines radiating from the eye, the lower reaching down to the lower lip.

From snout to vent 3 inches; tail 7.

Hab. Ceylon.

154. Calotes ophiomachus.

Agama ophiomachus, *Merrem, Tent.* p. 51.
Calotes ophiomachus, *Kelaart, Prodr.* p. 169; *Günth. Rept. B. I.* p. 142; *Theob. Cat.* p. 106; *Bouleng. Cat. Liz.* i, p. 327.

Upper head-scales smooth, imbricate, enlarged on supraorbital region; two groups of spines on each side of the head, between the ear and the nuchal crest; tympanum nearly half the diameter of the orbit. Gular sac not developed; gular scales feebly keeled, nearly as large as ventrals. A short oblique fold in front of the shoulder. Dorso-nuchal crest composed of closely set lanceolate spines directed backwards, with smaller ones at the base; in the male the height of the crest on the nape equals or exceeds the diameter of the orbit, and decreases gradually on the back. 31 to 35 scales round the middle of the body; dorsal scales very feebly keeled, or even quite smooth, with the points directed upwards and backwards; ventral scales larger than dorsals, very strongly keeled and mucronate. The adpressed hind limb reaches the anterior border of the orbit or a little beyond; third and fourth fingers nearly equal. Tail round. Green above, frequently with blackish-green

cross bands, broader than the interspaces between them; young sometimes with a whitish longitudinal band on each side of the back.

From snout to vent 5·5 inches; tail 20.

Hab. Ceylon, Southern India, Nicobars.

155. Calotes nigrilabris.

Calotes rouxii (*non D. & B.*), *Blyth, J. A. S. B.* xxii, 1853, p. 647.
Calotes nigrilabris, *Peters, MB. Ak. Berl.* 1860, p. 183; *Günth. Rept. B. I.* p. 143, pl. xiv, fig. D; *Theob. Cat.* p. 107; *Bouleng. Cat. Liz.* i, p. 328.

Upper head-scales smooth, imbricate, not or but slightly enlarged on supraorbital region; a short series of three to six small spines above and behind the posterior part of the tympanum; the latter measuring half, or more than half, the diameter of the orbit. Gular pouch not developed; gular scales more or less distinctly keeled, as large as ventrals. A strong oblique fold or pit in front of the shoulder. Dorso-nuchal crest composed of small lanceolate spines, the longest of which, on the nape, measure about two thirds the diameter of the orbit; on the back the crest is very distinct, but the spines gradually decrease in size. 43 to 47 scales round the middle of the body; dorsal scales rather feebly keeled, the upper pointing straight backwards, the others downwards and backwards; ventral scales much larger than dorsals, very strongly keeled, mucronate. The adpressed hind limb reaches the eye; third and fourth fingers equal. Tail round; in the males the scales on the basal part of the tail very large and hard, those of the median upper row forming a slightly serrated ridge. Green, uniform on the back and tail, or with angular whitish black-edged angular cross bars or ocelli, with or without a reddish-brown vertebral band; lips and sides of head with a broad black band or variegated with black in the male; female usually with a white, black-edged horizontal streak below the eye.

From snout to vent 4 inches; tail 12.

Hab. Ceylon.

156. Calotes liocephalus.

Calotes liocephalus, *Günth. A. M. N. H.* (4) ix, 1872, p. 86; *Theob. Cat.* p. 109; *Bouleng. Cat. Liz.* i, p. 329.

Upper head-scales smooth, imbricate, enlarged on supraorbital region; no spines whatever on the side of the head; tympanum measuring a little more than half the diameter of the orbit. Gular pouch not developed; gular scales much larger than ventrals, rathe feebly keeled. An oblique fold in front of the shoulder. Nuchal crest composed of narrow spines, the length of which equals the diameter of the tympanum; dorsal crest a mere serrated ridge. 45 scales round the middle of the body; dorsal scales feebly keeled, the upper ones pointing straight backwards or slightly upwards,

the others downwards and backwards; ventral scales strongly keeled, nearly the same size as the dorsals. The adpressed hind limb reaches the eye; third and fourth fingers equal. Tail round, the scales of its basal part very large and hard, those of the median upper row forming a serrated edge. Pale olive-green, above with transverse bands of a darker green; four angular reddish-brown cross bands on the back; a dark streak from the eye to above the tympanum; limbs and tail with alternate lighter and darker cross bands.

From snout to vent $3\frac{1}{2}$ inches; tail $10\frac{1}{2}$.

Hab. Ceylon.

157. Calotes rouxii.

Calotes rouxii, *Dum. & Bibr. Erp. Gén.* iv, p. 407; *Günth. Rept. B. I.* p. 142; *Theob. Cat.* p. 106; *Bouleng. Cat. Liz.* i, p. 330.
Calotes elliotti (*non Gthr.*), *Stoliczka, J. A. S. B.* xli, 1872, p. 113.

Upper head-scales feebly keeled, imbricate, strongly enlarged on supraorbital region; two small slender spines on each side of the back of the head, the anterior midway between the nuchal crest and the tympanum, the posterior just above the latter, which measures half the diameter of the orbit. Gular sac small; gular scales strongly keeled, nearly as large as the ventrals. A strong oblique fold or pit in front of the shoulder, and a transverse gular fold. Nuchal crest composed of a few slender erect spines, the longest of which measures the diameter of the tympanum; dorsal crest a mere denticulation. 55 or 57 scales round the middle of the body; dorsal scales of nearly the same size as the ventrals, keeled, those on the upper half of the body directed upwards and backwards, the others downwards and backwards; ventral scales strongly keeled and mucronate. The adpressed hind limb reaches the posterior border of the orbit; fourth finger longer than third. Tail slightly compressed, the scales on its basal part large and hard, those of the median upper row considerably enlarged and forming a serrated ridge. Olive-brown above, vertebral region rather lighter; a dark band from the eye, through the tympanum, along each side of the neck; the oblique fold in front of the shoulder black; dark lines radiating from the eye.

From snout to vent 3 inches; tail 6·5.

Hab. Matheran near Bombay.

158. Calotes ellioti.

Calotes rouxii (*non D. & B.*), *Jerdon, J. A. S. B.* xxii, 1853, p. 471.
Calotes elliotti, *Günth. Rept. B. I.* p. 142; *Theob. Cat.* p. 107; *Bouleng. Cat. Liz.* i, p. 330, pl. xxv, fig. 3.
Bronchocela indica, *Theob. l. c.* p. 105.

Upper head-scales feebly keeled, imbricate, much enlarged on supraorbital region; a small spine behind the supraciliary edge,

and two others on each side, the anterior midway between the nuchal crest and the tympanum, the posterior just above the latter, which measures nearly half the diameter of the orbit. Gular sac not developed; gular scales strongly keeled, smaller than the ventrals. A strong oblique fold or pit in front of the shoulder, and a transverse gular fold. Nuchal crest composed of a few widely separated slender spines, the longest of which measures about two thirds the diameter of the orbit; dorsal crest a mere denticulation. 53 to 61 scales round the middle of the body; dorsal scales of nearly the same size as the ventrals, keeled, the uppermost with the points directed straight backwards, the others directed downwards and backwards; ventral scales strongly keeled. The adpressed hind limb reaches the anterior border of the orbit or the tip of the snout; fourth finger longer than third. Tail scarcely compressed. Olive above, with more or less distinct angular dark-brown cross bands on the body; an angular black mark on each side of the neck; a white spot below the orbit; dark lines radiating from the eye.

From snout to vent 3 inches; tail 8·5.

Hab. Southern India, up to 6000 feet altitude in the Animalai Hills.

159. Calotes feæ.

Calotes feæ, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 477, pl. vi, fig. 2.

Upper head-scales unequal, juxtaposed, strongly keeled; a small spinose tubercle midway between the tympanum and the nuchal crest; two others above and a little behind the tympanum, which measures half the diameter of the orbit. Gular sac scarcely developed; gular scales smooth or indistinctly keeled, those on the sides very much larger, larger than on any other part of the body. A strong curved fold in front of the shoulder, nearly meeting its fellow on the throat. Nuchal crest composed of a few spines, the length of which equals the diameter of the tympanum; dorsal crest a slightly serrated ridge. 60 scales round the middle of the body, all keeled, the largest on the flanks, where they form irregular patches; dorsal scales directed backwards and slightly upwards. The hind limb reaches the gular fold; third and fourth fingers equal, much shorter than the fifth toe. Tail slightly compressed. Pale greenish above, with irregular brown cross bands on the body and tail, and a black network on the sides; snout blackish; lips with black vertical lines; black lines radiate from the eye; a black temporal band, covering the tympanum; limbs with blackish cross bands.

From snout to vent 3·75 inches; tail 7.

Hab. Pla-pu, Mountains of Northern Tenasserim, 3300–3600 feet.

Genus CHARASIA,

Gray, Cat. Liz. p. 246, 1845.

Tympanum distinct. Body slightly depressed, covered with uniform keeled scales. A very feeble dorsal crest. A pit on each side of the throat, usually connected by a transverse fold. No gular sac. Tail round or slightly compressed. No præanal or femoral pores or callosities.

Distribution. India.

Synopsis of the Species.

a. Tail longer than head and body; 115 to 140 scales round middle of body .... *C. dorsalis*, p. 144.
b. Tail longer than head and body; 80 to 100 scales round middle of body .... *C. blanfordiana*, p. 145.
c. Tail shorter than head and body; gular scales larger than ventrals .... *C. ornata*, p. 145.

160. Charasia dorsalis.

Agama dorsalis, *Gray, Griff. A. K.* ix, *Syn.* p. 56.
Charasia dorsalis, *Günth. Rept. B. I.* p. 156; *Theob. Cat.* p. 114; *Bouleng. Cat. Liz.* i, p. 332.

Head rather elongate in the adult, covered with small irregular smooth or feebly keeled scales, which are a little enlarged on the supraorbital region; two very small spines usually present above the tympanum; the latter larger than the eye-opening; cheeks strongly swollen in the adult male. A strongly marked transverse gular fold; gular scales very small, subimbricate, smooth, very feebly keeled in the young. Scales on the body very small (115 to 140 round the middle), subimbricate, and smooth or indistinctly keeled in the adult, more distinctly keeled and imbricate in the young, the keels of the dorsal scales directed obliquely towards the vertebral line. Dorso-nuchal crest scarcely indicated by a slight ridge. Limbs covered with small scales slightly larger than those on the body; digits moderately elongate; the adpressed hind limb reaches between the tympanum and the posterior border of the orbit in the adult, beyond the latter point in the young. Tail round, slightly compressed and much swollen at the base in the adult male, covered with small, more or less distinctly keeled scales which are a little enlarged inferiorly and on the upper median series; its length equals nearly once and three fourths that of head and body. Young olive-brown, spotted or marbled with brown, and with a series of rounded white spots along each side of the back; this coloration more or less distinctly retained in the female; male yellow or red, with a broad black lateral band commencing from the eye.

From snout to vent 5·5 inches; tail 10·5.

Hab. Southern India; only found on rocks at some elevation above the sea, up to 6000 feet in the Nilgiris.

161. Charasia blanfordiana.

Charasia dorsalis (*non Gray*), *Blanf. J. A. S. B.* xxxix, 1870, p. 368.
Charasia blanfordiana, *Stoliczka, J. A. S. B.* xli, 1872, p. 110, pl. iii, fig. 5; *Theob. Cat.* p. 115; *Bouleng. Cat. Liz.* i, p. 333.

This species is very closely allied to the preceding, but remains smaller; the scales are a little larger (80 to 100 round the middle of the body) and always distinctly keeled and imbricate; and the hind limb stretched forwards extends at least to the posterior border of the orbit. The nuchal crest is a little more developed. Frequently a small spine behind the supraciliary edge, and a few scattered slightly enlarged scales on the flanks. Young olive-brown above, spotted or marbled with brown, and with a series of more or less distinct large lozenge-shaped brown spots on the back; these markings persist in the adult female, but are absent in the male, which has a more or less distinct dark lateral band as in *C. dorsalis*, and in the breeding-season, May, has the head scarlet, belly, limbs, and tail blackish.

Hab. South-western Bengal to Chhatisgarh and the Godávari valley; S.E. Berar? Rarely seen except on high rocks, especially on hills of granitoid gneiss.

162. Charasia ornata.

Brachysaura ornata, *Blyth, J. A. S. B.* xxv, 1856, p. 448; *Theob. Cat.* p. 110; *Cockburn, J. A. S. B.* li, 1882, p. 50.
Charasia ornata, *Bouleng. Cat. Liz.* i, p. 334.

Habit stout; head large, short and convex. Upper head-scales subequal, tubercular, obtusely keeled; two small spines surrounded by still smaller ones on each side of the back of the head, above the tympanum; the latter not quite so large as the eye-opening. Gular fold not well marked; gular scales larger than ventrals, feebly keeled. 57 scales round the middle of the body. Dorsal scales much larger than ventrals, rhomboidal, imbricate, keeled, the keels converging obliquely towards the vertebral line; ventral scales feebly keeled. Nuchal and dorsal crests not continuous, reduced to a mere serrated ridge. Limbs, and especially digits, rather short; the adpressed hind limb reaches the neck; scales on limbs much smaller than those on the back. Tail round, as long or not quite so long as head and body, covered with equal, strongly keeled scales. Pale brown above, with three rows of darker, light-edged spots on the back, the median row most distinct and formed of rhomboidal spots; limbs and tail with dark cross bars.

From snout to vent 3·5 inches; tail 3·5.

Hab. Central India (Saugor); North-west Provinces (Allahabad, Bánda); Cutch.

A true ground-lizard, of sluggish habits. According to Cockburn it appears to be nocturnal in its habits, and it is only in the evening, or when its holes are flooded, that numbers are to be seen.

Genus AGAMA,

Daudin, Hist. Rept. iii, p. 333, 1802.

Tympanum distinct. Body more or less depressed. Dorsal crest absent or feebly developed. A pit on each side of the throat and a transverse gular fold. Gular sac present or absent. Tail round or feebly compressed. No femoral pores: males with callose præanal scales.

Distribution. The whole of Africa and South-western Asia; in the Indian Region only in the North-western and Himalayan areas. 43 species are known.

Agamas are found in barren localities or on rocks, sometimes on shrubs.

Fig. 43.—*Agama isolepis.* Upper surface of head and anal region.

Synopsis of Indian Species.

A. Tail not verticillate.
 a. Dorsal scales keeled .... *A. isolepis*, p. 147.
 b. Dorsal scales smooth .... *A. rubrigularis*, p. 147.
B. Tail verticillate, the caudal segments composed of more than two whorls of scales.
 a. Ventral scales not much smaller than largest dorsals.
  a'. Dorsal scales keeled; upper head-scales smooth or feebly keeled............. *A. tuberculata*, p. 148.
  b'. Dorsal scales keeled; upper head-scales sharply keeled .... *A. dayana*, p. 148.
  c'. Dorsal scales smooth or very feebly keeled *A. himalayana*, p. 149.
 b. Ventral scales not more than half size of largest dorsals.
  a'. Upper head-scales keeled; dorsal scales sharply keeled; flanks with enlarged scales .... *A. agrorensis*, p. 149.
  b'. Median dorsal scales of unequal width, forming regular longitudinal series .... *A. melanura*, p. 150.
  c'. Median dorsal scales equal, forming regular longitudinal series; no enlarged scales on the flanks .... *A. lirata*, p. 150.
  d'. Dorsal scales large, equal, mucronate, the keels forming oblique lines .... *A. nupta*, p. 151.
C. Tail verticillate, divided into distinct segments each composed of two whorls of scales. *A. caucasica*, p. 151.

163. Agama isolepis.

Agama agilis (*non Oliv.*), *Blanf. Zool. E. Persia*, p. 314; *Murray, Zool. Sind*, p. 371.
Trapelus megalonyx (*non Günth.*), *Stoliczka, P. A. S. B.* 1872, pp. 88, 127; *Murray, l. c.* p. 370.
Agama isolepis, *Bouleng. Cat. Liz.* i, p. 342; *id. Tr. Linn. Soc.* (2) v, 1889, p. 96, pl. x.

Head moderate, convex, subcordiform. Nostril not tubular, superior, pierced just above the canthus rostralis in the posterior part of a flat nasal. Upper head-scales convex, smooth or feebly keeled; occipital not enlarged; generally a few short spines on the post-temporal region and a few on the upper edge of the ear, which is exposed and not larger than the eye-opening; males with a small gular pouch. Body roundish, moderately depressed, covered above with equal, rhomboidal, imbricate, keeled, more or less distinctly mucronate scales; lateral and ventral scales much smaller, feebly keeled, exceptionally smooth. Limbs moderate; tibia a little longer than the skull (to occiput); third finger shorter than fourth, fifth not extending as far as second; third toe much shorter than fourth, fifth not extending quite as far as first. Tail $2\frac{1}{4}$ to $2\frac{2}{3}$ times as long as distance from gular fold to vent, rounded, covered with keeled scales. Male with a single or double row of callose præanal scales. Sandy grey or brown above, with or without dark transverse bands and light rhomboidal vertebral spots; the collar-pit blackish; lower surfaces white, often with dark longitudinal lines more or less distinctly marked; males during the breeding-season with the sides of the body and the throat deep blue.

From snout to vent 4·5 inches; tail 7.

Hab. Punjab, Sind, Baluchistan, Persia, Egypt. On rocky hills and open plains, or on shrubs.

164. Agama rubrigularis.

Trapelus rubrigularis, *Blanf. P. A. S. B.* 1875, p. 233, *and J. A. S. B.* xlv, 1876, p. 23, pl. i, fig. 1; *Murray, Zool. Sind*, p. 371.
Agama rubrigularis, *Bouleng. Cat. Liz.* i, p. 346.

Head short, convex, subcordiform. Nostril not tubular, pierced in the posterior part of a slightly swollen nasal just above the canthus rostralis. Upper head-scales keeled; occipital not enlarged; no distinct spines on the hinder part of the head; a very slight fringe of pointed scales on the upper edge of the ear, which is hardly as large as the eye-opening. Male without gular pouch. Body depressed, covered above with small rhomboidal, imbricate, smooth scales intermixed with much larger, flat, feebly keeled ones forming more or less irregular transverse series; no enlarged scales on the limbs; ventral scales smooth. Limbs moderate; tibia not quite so long as the skull (to occiput); third finger shorter than fourth, fifth not extending as far as second; third toe much shorter than fourth; fifth not extending as far as first. Tail $1\frac{2}{3}$ to $1\frac{3}{4}$ times as long as the distance from gular fold to vent, rounded, rather depressed at the base, covered with keeled scales. Male with a row of callose præanal scales. Colour olive-brown to grey, spotted with pale

yellow, each enlarged scale of the back being in the middle of a pale spot; a dusky longitudinal line on each side of the neck and three or four pairs of dark spots on the back; a bright red patch beneath the throat in living specimens of both sexes.

From snout to vent 3·6 inches; tail 3·3.

Hab. Sind, in the sandy desert or semi-desert along the base of the Khirthar hills.

165. Agama tuberculata.

Agama tuberculata, *Gray, Zool. Journ.* iii, 1827, p. 218; *id. Ill. Ind. Zool.* ii, pl. lxxiii; *Bouleng. Cat. Liz.* i, p. 361.
Stellio indicus, *Blyth, J. A. S. B.* xxii, 1853, p. 646.
Barycephalus sykesii, *Günth. P. Z. S.* 1860, p. 150, pl. xxv, fig. A.
Stellio tuberculatus, *Günth. Rept. B. I.* p. 157; *Theob. Cat.* p. 116.

Head much depressed; snout longer than the diameter of the orbit; nostril lateral, below the canthus rostralis, slightly tubular. Upper head-scales smooth or feebly keeled; occipital not enlarged; small closely-set spinose scales on the sides of the head near the ear, and on the neck; ear entirely exposed, larger than the eye-opening. Throat strongly plicate; no gular pouch. Body depressed, with a more or less distinct fold on each side of the back; scales on the neck and sides minute, almost granular, keeled, uniform or intermixed with scattered enlarged scales; those on the vertebral region enlarged, equal, rhomboidal, imbricate, strongly keeled; a very slight indication of a nuchal denticulation; ventral scales smooth, nearly as large as the enlarged dorsals. Limbs strong, with compressed digits; the scales on the upper surface of the limbs much enlarged and very strongly keeled; third and fourth fingers equal, or fourth very slightly longer; fourth toe slightly longer than third, fifth extending beyond first. Tail rounded, much depressed at the base, covered with moderate-sized strongly keeled scales arranged in rings; its length equals $2\frac{1}{2}$ to 3 times the distance from gular fold to vent. Males with a large patch of thickened præanal scales and a patch of similar scales on the middle of the belly. Olive-brown above, spotted or speckled with blackish, sometimes with small yellowish spots; the breeding male's throat blue, with light spots; sometimes a light vertebral band.

From snout to vent 4·5 inches; tail 8.

Hab. Western Himalayas, up to 12,000 feet; Kashmir.

166. Agama dayana.

Stellio dayanus, *Stoliczka, J. A. S. B.* xli, 1872, p. 113, pl. iii, fig. 4; *Theob. Cat.* p. 117.
Agama dayana, *Bouleng. Cat. Liz.* i, p. 362.

Differs from *A. tuberculata* in having the head-scales sharply keeled, and the enlarged dorsal scales distinctly continuous, though considerably smaller, on the neck and up to the occiput.

Hab. Hardwár, foot of Western Himalayas. I have not seen examples of this species.

167. Agama himalayana.

Stellio himalayanus, *Steind. Novara, Rept.* p. 22, pl. i, fig. 8; *Theob. Cat.* p. 118.
Agama himalayana, *Bouleng. Cat. Liz.* i, p. 362.

Head much depressed; snout slightly longer than diameter of orbit; nostril lateral, below the canthus rostralis, slightly tubular. Upper head-scales smooth; occipital not enlarged; small closely set spinose scales on the head near the ear, and on the neck; ear entirely exposed, larger than the eye-opening. Throat strongly plicate; no gular pouch. Body depressed, with a more or less distinct fold on each side of the back; scales on the neck and sides small, smooth or very feebly keeled, uniform, those on the vertebral region enlarged, equal, roundish-hexagonal, imbricate, smooth or very feebly keeled; ventral scales smooth, a little smaller than the enlarged dorsals. Limbs strong, with compressed digits; the scales on the upper surface large and strongly keeled; fourth finger slightly longer than third; fourth toe considerably longer than third, the extremity of the claw of the latter not reaching the base of the claw of the former; fifth toe extending beyond first. Tail rounded, much depressed at the base, covered with moderate-sized strongly keeled scales arranged in rings; its length equals 2½ to 3 times the distance from gular fold to vent. Males with a double or triple row of thickened præanal scales. Olive above, marbled with black, and generally with round light spots producing a network; sometimes the black spots forming a festooned band on each side of the vertebral line; the male's throat marbled with blackish.

From snout to vent 3 inches; tail 3·25.

Hab. Upper Indus Valley, Ladák, Tibet.

168. Agama agrorensis.

Stellio agrorensis, *Stoliczka, P. A. S. B.* 1872, p. 128.
Agama agrorensis, *Bouleng. Cat. Liz.* i, p. 363.

Head much depressed; snout longer than the diameter of the orbit; nostril lateral, below the canthus rostralis. Upper head-scales keeled; occipital not enlarged; small spinose scales on the sides of the head near the ear, and on the neck; ear entirely exposed, larger than the eye-opening. Throat strongly plicate; no gular pouch. Body depressed, with a slight fold on each side of the back; scales on the neck and sides of the back very small, almost granular, keeled, those on the vertebral region and on the flanks enlarged, rhomboidal, imbricate, strongly keeled; a very slight indication of nuchal denticulation; ventral scales smooth, much smaller than the enlarged dorsals. Limbs and tail as in *A. tuberculata*. Male with a patch of thickened præanal scales, and a double longitudinal row of similar scales on the middle of the belly. Olive above, spotted with yellow, sometimes with dark and light longitudinal bands: the male's throat reticulated with grey.

From snout to vent 3·5 inches.

Hab. Agror Valley, in Northern Punjab, about 6000 feet above the sea; Jhelum valley above Murree; Kashmir.

169. Agama melanura.

Laudakia (Plocederma) melanura, *Blyth, J. A. S. B.* xxiii, 1854, p. 738.
Laudakia tuberculata (*non Gray*), *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 38.
Stellio melanurus, *Anders. P. A. S. B.* 1871, p. 189; *Theob. Cat.* p. 117; *Blanf. J. A. S. B.* xlv, 1876, p. 25.
Agama melanura, *Bouleng. Cat. Liz.* i, p. 363.

Head depressed, triangular, as broad as long; snout as long as the diameter of the orbit; nostril lateral, just below the canthus rostralis, slightly tubular. Upper head-scales smooth; occipital not enlarged; a group of small spines in front of the ear, and other scattered ones below; ear opening twice as large as the eye-opening. Throat strongly plicate; no gular pouch. Body depressed, with a slight fold on each side of the back; scales on the neck and sides very small, on the latter region mucronate and feebly keeled; median dorsal scales enlarged, rhomboidal, imbricate, strongly keeled, forming regular longitudinal series, some of which are larger than the others; a very slight indication of a nuchal denticulation; ventral scales smooth, smaller than the largest dorsals. Limbs strong, with compressed digits; the scales on the upper surface of the limbs large and very strongly keeled and spinose; third and fourth fingers nearly equal; fourth toe very slightly longer than third; fifth extending beyond first. Tail rounded, depressed at the base, covered with large strongly keeled spinose scales forming annuli; it is four times as long as the distance from gular fold to vent. Males with a patch of callose præanal scales, and another patch of similar scales on the middle of the belly. Head and neck yellow, the rest of the body blackish brown.

From snout to vent 4·5 inches; tail 9.

Hab. Plateau north of Salt Range, Punjab; Khirthar, Sind.

170. Agama lirata.

Stellio lirata, *Blanf. A. M. N. H.* (4) xiii, 1874, p. 453, *and Zool. E. Pers.* p. 320, pl. xx, fig. 2,
Agama lirata, *Bouleng. Cat. Liz.* i, p. 364.

Very closely allied to the preceding, but the scales on the snout bluntly keeled, and the dorsal scales equal, forming six or seven rows on the middle of the back. Dusky above, with imperfect blackish transverse markings; a small blackish pit before each shoulder.

From snout to vent 4 inches.

Hab. The only specimen known, which I have not seen, was found on rocks in some barren hills in the Dasht province of Western Baluchistan.

171. Agama nupta.

Agama nupta, *De Fil. Giorn. Ist. Lomb.* vi, 1843, p. 407 ; *Bouleng. Cat. Liz.* i, p. 365.
Stellio nuptus, *Blanf. E. Pers.* p. 317, pl. xix, fig. 1; *Murr. Zool. Sind*, p. 369.

Head depressed, triangular; nostril rather large, slightly tubular, pierced on the canthus rostralis; upper head-scales smooth; occipital not enlarged; borders of the tympanum and sides of neck with groups of well-developed spines ; ear-opening much larger than the eye-opening. Throat strongly plicate ; no gular pouch; a transverse fold on the neck. Body depressed ; a distinct curved fold from the neck to the sides; dorsal scales rather large, rhomboidal, strongly imbricate, shortly mucronate, keeled, the keels forming oblique lines converging towards the vertebral line; flanks with minute scales ; ventral scales smooth, much smaller than dorsals and much larger than laterals. Limbs strong, digits compressed ; scales on upper surface of limbs as large as the dorsals, or a little smaller; third and fourth fingers nearly equal; fourth toe slightly longer than third, fifth extending beyond first. Tail round or slightly compressed, depressed at the base, nearly three times as long as the distance from gular fold to vent; caudal scales larger than dorsals, mucronate, feebly keeled, forming regular annuli. Male with a patch of thickened præanal scales and a similar patch of ventral scales. Yellowish brown above, uniform or with a darker network of dots; fore limbs dusky or blackish; posterior half of tail black, or annulate with black; gular region marbled yellow and dark blue.

From snout to vent 6 inches ; tail 12.

A variety (*fusca*, Blanf.) is distinguished by having the transverse nuchal fold less distinct, and the spines on the sides of head and neck rather longer. General colour blackish brown, throat yellowish.

Hab. Persia, Baluchistan, Afghanistan, Upper Sind.

172. Agama caucasica.

Stellio caucasicus, *Eichw. Zool. Spec.* p. 187, *and Faun. Casp.-Cauc.* p. 80, pl. xiii, figs. 1-8; *Blanf. E. Persia*, p. 322, pl. xx, fig. 1.
Agama caucasica, *Bouleng. Cat. Liz.* i, p. 367.

Head much depressed; nostril lateral, below the canthus rostralis, slightly tubular. Upper head-scales smooth; occipital not enlarged; small conical spinose scales on the side of the head near the ear, and on the neck; ear larger than the eye-opening. Throat strongly plicate ; no gular pouch. Body much depressed, with a very indistinct lateral fold; nuchal and latero-dorsal scales very small, granular ; vertebral region with enlarged flat, feebly keeled, rather irregular scales; flanks with enlarged, strongly keeled or spinose scales; no nuchal denticulation; ventral scales smooth, distinctly smaller than the enlarged dorsals. 150 to 160 scales round the middle of the body. Limbs strong, with compressed digits ; the scales on the upper surface of limbs much enlarged, strongly keeled, generally spinose; fourth finger slightly longer

than third; fourth toe a little longer than third, fifth extending beyond first. Tail rounded, depressed at the base, covered with rather large spinose scales arranged in rings, two rings forming a distinct segment; the length of the tail does not equal quite twice the distance from gular fold to vent. Male with a large patch of callose præanal scales and an enormous patch of similar scales on the belly. Olivaceous above, with round yellowish black-edged spots, the black frequently forming a network; vertebral region yellowish; limbs with more or less distinct yellowish cross bars; lower surface yellowish in the female, blackish in the breeding male.

From snout to vent 5 inches.

Hab. From the Caucasus to Persia, Baluchistan, and Afghanistan. This species occurs near Quetta.

Genus **PHRYNOCEPHALUS,**

Kaup, Isis, 1825, p. 591.

Tympanum hidden. Body depressed. No dorsal crest. A transverse gular fold; no gular sac. Tail cylindrical or transversely oval in section. No femoral or præanal pores.

Distribution. Central Asia, borders of the Caspian Sea, Persia, Baluchistan.

Sand-Agamoids, stated to be viviparous. Some 15 species are known, of which four occur in Baluchistan and one in Northern Kashmir.

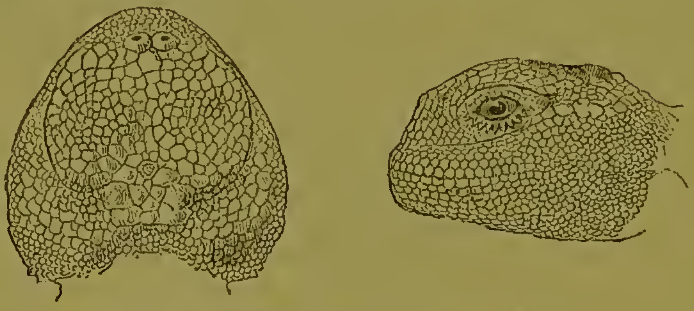


Fig. 44.—Head of *Phrynocephalus olivieri.*

Synopsis of Indian Species.

A. Dorsal lepidosis composed of small scales intermixed with scattered enlarged ones; digits feebly fringed; no spinose scales on sides of head and neck .... *P. olivieri*, p. 153.

B. Dorsal lepidosis homogeneous; no spinose scales on sides of head and neck.

- *a.* Tail not more than $1\frac{2}{3}$ times the distance from gular fold to vent .... *P. theobaldi*, p. 153.
- *b.* Tail about twice the distance from gular fold to vent.
  - *a'*. Nasal shield separated from its fellow by 3 to 5 longitudinal series of scales .... *P. caudivolvulus*, [p. 154.
  - *b'*. Nasal shields in contact .... *P. ornatus*, p. 154.
  - *c'*. Nasal shields separated by one scale ...... *P. maculatus*, p. 155.

C. Dorsal lepidosis heterogeneous; digits strongly fringed; sides of head and neck with series of erect pointed scales .... *P. luteoguttatus*, [p. 155.

173. Phrynocephalus olivieri.

Phrynocephalus olivieri, *Dum. & Bibr. Erp. Gén.* iv, p. 517; *Blanf. Zool. E. Persia*, p. 327; *Bouleng. Cat. Liz.* i, p. 370; *id. Tr. Linn. Soc.* (2) v, 1889, p. 96, pl. viii, fig. 2.
Phrynocephalus tickelii, *Günth. Rept. B. I.* p. 160.

Snout extremely short; upper head-scales large, smallest on the middle of the supraorbital region, where they are about the size of the median dorsals; nostril directed forwards and upwards; nasal large, in contact with its fellow (quite exceptionally separated by a series of scales). Dorsal scales flat, smooth, juxtaposed or slightly imbricate, with scattered enlarged nail-like scales; sides more or less folded, with small granular scales intermixed with scattered enlarged ones. Gular, pectoral, and ventral scales smooth, the former very small but not granular; ventrals square, forming slightly oblique transverse series. Outer edge of third and fourth toes feebly denticulated. Tibia longer than the skull. Tail round, gradually tapering to a fine point, covered with smooth or slightly keeled scales; on the basal portion of the tail they are intermixed with enlarged conical scales; the length of the tail equals once and two thirds to a little more than twice the distance from gular fold to vent. Grey above, marbled with darker and spotted with lighter; sometimes a blackish cross band behind the scapular region, and another in front of the sacral region; sometimes a large zone on the middle of the back, uniform light grey; limbs and tail with blackish cross bars, on the latter forming annuli which are deep black on the lower surface; body and limbs white beneath.

From snout to vent 2 inches; tail 3.

Hab. Persia, Baluchistan, at elevations from 2000 to 7000 feet; Afghanistan.

174. Phrynocephalus theobaldi.

Phrynocephalus theobaldi, *Blyth, J. A. S. B.* xxxii, 1863, p. 90; *Bouleng. Cat. Liz.* i, p. 373.
Phrynocephalus caudivolvulus, *Günth. Rept. B. I.* p. 161; *Theob. Cat.* p. 115.

Forehead very convex, with enlarged convex scales; supraorbital scales about as large as the largest dorsals; occipital scales much larger; nostril directed forwards; nasal separated from its fellow by one or three longitudinal rows of scales. Dorsal scales homogeneous, small, granular on the sides, enlarged, flat, and subimbricate on the vertebral region, all perfectly smooth; pectorals and ventrals small, perfectly smooth, not mucronate. Outer side of third and fourth toes feebly but distinctly denticulated. Tibia as long as the skull. Tail roundish, thickened and depressed at the base, covered with smooth scales, ending obtusely; its length $1\frac{1}{2}$ to $1\frac{2}{3}$ times the distance from gular fold to vent. Grey above, more or less spotted with blackish or with light, dark-edged ocelli; lower surface white; male with the middle of the throat and of the belly, and the end of the tail beneath, black.

From snout to vent 2 inches; tail 2·5.

Hab. Upper Indus Valley and Turkestan.

175. Phrynocephalus caudivolvulus.

Lacerta caudivolvula, *Pallas, Zoogr. Rosso-As.* iii, p. 27.
Phrynocephalus caudivolvulus, *Günth. Rept. B. I.* p. 161 (part.); *Bouleng. Cat. Liz.* i, p. 375.

Forehead convex and slightly sloping, with moderately enlarged convex scales; occipital scales larger than the median dorsals; supraorbital scales very small, granular, or nearly as large as median dorsals; nostril directed forwards and slightly upwards; nasal separated from its fellow by 3 to 5 longitudinal series of scales. Dorsal scales homogeneous, small, granular on the sides, enlarged, flat, and subimbricate, smooth or feebly keeled on the vertebral region. Gular scales smooth or indistinctly keeled; pectoral and anterior ventral scales strongly keeled and mucronate, posterior ventrals smooth. Scales on upper surface of limbs keeled. Both sides of third and fourth toes with a strong fringe of acute lobules. Tibia longer than the skull. Tail not quite twice as long as the distance from gular fold to vent, swollen and much depressed at the base, then roundish depressed, tapering to a rather fine point, the end curling upwards; except on the basal portion of the tail, the scales are keeled. Greyish above, spotted, marbled, or vermiculated with blackish; tail beneath with 3 to 5 black bars alternating with white ones of nearly equal width; lower surfaces white.

From snout to vent 2 inches; tail 2·6.

Hab. From the shores of the Caspian Sea to Turkestan; Ladák (*fide* Schlagintweit).

176. Phrynocephalus ornatus.

Phrynocephalus ornatus, *Bouleng. Cat. Liz.* iii, p. 496; *id. Tr. Linn. Soc.* (2) v, 1889, p. 97, pl. viii, fig. 3.

Forehead convex and slightly sloping, with scarcely enlarged keeled scales; occipitals very feebly enlarged; supraocular scales a little smaller than median dorsals, imbricate, feebly keeled; nostril directed forwards and upwards; nasals very large and in contact mesially. Dorsal scales homogeneous, small and granular on the sides, enlarged, flat, imbricate, and feebly keeled on the back. Gular, pectoral, and ventral scales smooth or indistinctly keeled. Scales on upper surface of limbs feebly keeled. Digital fringes moderately developed, stronger on the outer side of the fourth toe than on the inner. Tibia much longer than the skull. The hind limb reaches beyond the tip of the snout. Tail nearly twice as long as the distance from gular fold to vent, strongly depressed at the base, roundish-depressed throughout the greater part of its length; except on the basal portion of the tail, the scales are keeled. Yellowish or yellowish-grey above, with small grey or blackish specks and symmetrical markings; usually a few rose-coloured, purple-edged spots on the anterior part of the back and smaller orange ones on the hinder part; head with one or two orange trans-

verse markings; usually a blackish or purplish-grey, straight-edged or festooned lateral band, which may be edged above with a yellowish-white band; a grey band along the hinder side of the thighs. Tail sometimes with regular elliptical brown or orange spots above, separated by a yellowish-white chain. Lower surfaces white; tail usually lemon-yellow, constantly with 4 or 5 black spots.

From snout to vent 1·5 inches; tail 2·1.

Hab. Between Nushki and Helmand River, in Northern Baluchistan.

177. Phrynocephalus maculatus.

Phrynocephalus maculatus, *Anders. P. Z. S.* 1872, p. 389, fig.; *Blanf Zool. E. Pers.* p. 331; *Bouleng. Cat. Liz.* i, p. 377; *id. Tr. Linn Soc.* (2) v, 1889, pl. ix, fig. 3.

Forehead convex, with slightly enlarged scales; median supraorbital scales as large as or smaller than the median dorsals; occipital scales slightly enlarged; nostril directed upwards; nasal separated from its fellow by one scale. Dorsal scales homogeneous, smaller on the sides, rhomboidal, imbricate, smooth. Gular, pectoral, and abdominal scales smooth. Scales on the limbs smooth or feebly keeled. Third and fourth toes with feeble lateral denticulation. Tibia longer than the skull. Tail depressed, especially at the base, tapering to a point, covered with keeled scales; its length equals nearly twice the distance from gular fold to vent. Greyish above, speckled or guttate with whitish, and with more or less distinct darker dots, spots, or cross bands; lower surface white; end of tail black beneath.

From snout to vent 2·5 inches; tail 4.

Hab. Persia, Northern Baluchistan.

178. Phrynocephalus luteoguttatus.

Phrynocephalus luteoguttatus, *Bouleng. Cat. Liz.* iii, p. 497; *id. Tr. Linn. Soc.* (2) v, 1889, p. 98, pl. viii, fig. 4.

Head much depressed, forehead convex, not sloping; upper head-scales small, obtusely keeled, not enlarged on the occipital region; nostril directed forwards and upwards; nasals in contact mesially; three or four series of scales between the orbit and the upper labials; none of the chin-shields in contact with the mental or the lower labials. Sides of head and neck with series of erect pointed scales. A fold along the flanks. Dorsal scales rather large, rhomboidal, obtusely keeled, intermixed with some that are enlarged, obtusely keeled, and flat; lateral scales smaller, equal. Gular, pectoral, and ventral scales smooth or very feebly keeled, ending in a point; median gulars nearly as large as ventrals. Scales on upper surface of limbs keeled. Digits strongly fringed, the fringe extremely strong on the outer side of the fourth toe. Tibia longer than the skull. The adpressed hind limb reaches the eye. Tail about as long as head

and body, depressed throughout; caudal scales keeled. Yellowish brown or pale buff above, with black dots and round pale yellow spots; the sides sometimes blackish; frequently a blackish streak along the outer side of the leg; eyelids salmon-pink. Lower surfaces white, belly sometimes pink; tail salmon-pink, usually black at the end, and with 1 to 3 black spots.

From snout to vent 1·6 inches; tail 1·6.

Hab. Northern Baluchistan, between Nushki and Helmand River.

Genus **LIOLEPIS**,

Cuvier, Règne An. 2nd ed. ii, p. 37, 1829.

Tympanum distinct. Body depressed; skin of sides lax, expansible; no crest; scales very small. No gular pouch; a strong transverse gular fold. Tail long, rounded, feebly depressed. Femoral pores.

Distribution. South-eastern Asia. A single species.

179. **Liolepis belliana.**

Uromastix belliana, *Gray, Zool. Journ.* iii, 1827, p. 220.
Uromastix bellii, *Gray, Ill. Ind. Zool.* ii, pl. lxxii.
Liolepis bellii, *Cantor, J. A. S. B.* xvi, 1847, p. 647; *Bouleng. Cat. Liz.* i, p. 403.
Liolepis guttatus, *Günth. Rept. B. I.* p. 154; *Theob. Cat.* p. 119.

Head rather small; snout with strongly curved profile, as long as the diameter of the orbit or a little longer; nostril large, directed backwards; tympanum large, vertically oval; upper head-scales small and strongly keeled on the snout and interorbital region, minute and granular on the supraorbital region and the occiput; no occipital. Gular scales small, granular; a series of chin-shields on each side, parallel with the infralabials, the first shield in contact with the pentagonal mental and the first infralabial. Side of neck plicate; a more or less distinct fold along the side of the body. Dorsal scales minute, granular, feebly keeled, uniform; ventral scales larger, subimbricate, smooth. Limbs rather long, with long slender digits and long claws; the adpressed hind limb reaches the neck or the tympanum; 14 to 21 femoral pores on each side. Tail about twice as long as head and body, round, depressed at the base, tapering to a fine point, covered with small, equal, keeled scales, largest beneath. Grey, brownish or blackish above, with yellowish black-edged spots which may form ocelli or be confluent into longitudinal bands; sides with black and orange vertical bars; lower surfaces yellow, uniform or variegated with black or blue.

From snout to vent 7 inches; tail 13.

Hab. South Canara, Burma, Malay Peninsula, Siam, Southern China.

This lizard is herbi- and frugivorous. Its power of expanding its flanks in a sort of wing, supported by the very elongate spurious ribs,

which foreshadows the parachute of the Dragons and bears great analogy to the hood of the Cobra, has led Cantor to suppose it to be an arboreal form. But Mr. Theobald, who has observed it in its haunts, states that it is absolutely terrestrial and a burrower, like *Uromastix*; that he has never seen it seek a tree, or adopt any means of escape but a hasty retreat to its burrow. The use of the lateral expansions to the lizard is probably to expose a greater surface when sunning itself. As observed by Cantor, fear or anger will cause a momentary expansion, as in the case of the Cobra.

Genus **UROMASTIX**,

Merrem, Tent. Syst. Amph. p. 56, 1820.

Tympanum distinct. Incisors large, uniting in the adult into one or two cutting-teeth, separated from the molars by a toothless interspace. Body depressed, without crest. No gular pouch; a transverse gular fold. Tail short, depressed, covered with whorls of large spinose scales. Præanal and femoral pores present.

Distribution. Arid tracts of North Africa and South-western Asia. 7 species are known.

These Lizards are herbi- and frugivorous, and terrestrial; they live in burrows, resembling rabbit-holes, dug by themselves.

180. **Uromastix hardwickii.**

Uromastix hardwickii, *Gray, Zool. Journ.* iii, 1827, p. 219; *id. Ill. Ind. Zool.* ii, pl. lxxi; *Günth. Rept. B. I.* p. 155; *Theob. Cat.* p. 119; *Murray, Zool. Sind,* p. 372; *Bouleng. Cat. Liz.* i, p. 408.

Fig. 45.—*Uromastix hardwickii.*

Head small, feebly depressed, with short snout and obtuse canthus rostralis; nostril large, directed backwards, nearer the end of the snout than the eye; tympanum large, vertically elliptical,

anterior border very slightly denticulated; upper head-scales smooth, much larger than those on the body, smallest on supraocular region; occipital not enlarged; labials small and numerous. Neck strongly plicate. Scales on upper surface very small, uniform or with slightly enlarged ones forming irregular cross series on the back; ventral scales larger, flat, smooth, juxtaposed or subimbricate. Limbs short and thick; hind limb with spinose conical tubercles; digits short. 9 to 11 femoral, and 5 or 6 præanal pores on each side. Tail above with cross series of enlarged spinose scales, largest on the sides, gradually decreasing in size towards the median line; the rows of spines separated from each other by two to four rows of small keeled scales; lower surface of tail covered with small scales scarcely larger than the abdominals. Sand-coloured above, uniform or with darker dots or vermiculations; lower surfaces whitish; a large black spot on the anterior face of the thigh.

From snout to vent 5 inches; tail 7.

Hab. North-western India and Baluchistan in semi-deserts.

Family IV. ANGUIDÆ.

Skull with bony postorbital and postfronto-squamosal arches; dermal cranial ossifications are present, which roof over the supratemporal fossa; præmaxillary single; nasals distinct; parietal single; a fibro-cartilaginous interorbital septum; a columella cranii (ectopterygoid). Dentition pleurodont. Body protected by bony plates underlying the scales. Clavicle slender. Tongue moderately elongate, bifid posteriorly, nicked anteriorly, composed of two distinct portions: a principal posterior, thick, covered with villiform papillæ, and a small anterior, extrusible and retractile into a sheath formed by a transverse fold at the anterior extremity of the villose portion. Head with symmetrical shields. Scales imbricate. No femoral or præanal pores.

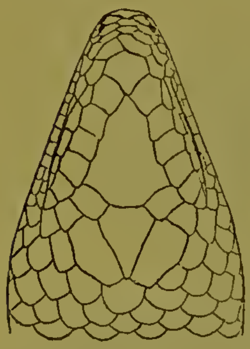


Fig. 46.—Head of *Ophisaurus gracilis*.

The type of this family is the well-known European Slow-worm (*Anguis fragilis*). The only Indian species (*Ophisaurus gracilis*), likewise apodal and serpentiform, belongs to a genus which is represented by two North-American species, one Europæo-Asiatic, ranging from Dalmatia to Afghanistan, and a fifth from Morocco. The family (45 species) is otherwise confined to the New World.

Genus OPHISAURUS,

Daudin, Rept. vii, p. 346, 1803.

A lateral fold. Scales squarish-rhomboidal, forming straight longitudinal and transverse series. Limbs absent externally, or reduced to a rudiment of the hind pair. Teeth with conical or subspherical crowns. Pterygoid teeth.

Distribution. South-eastern Europe, North Africa, South-western Asia, Himalayas and Burma, Central America.

181. Ophisaurus gracilis.

Pseudopus gracilis, *Gray, Cat. Liz.* p. 56; *Günth. Rept. B. I.* p. 75; *Theob. Cat.* p. 47.
Ophiseps tessellatus, *Blyth, J. A. S. B.* xxii, 1853, p. 655.
Ophisaurus gracilis, *Bouleng. Cat. Liz.* ii, p. 283, pl. xv, fig. 1.

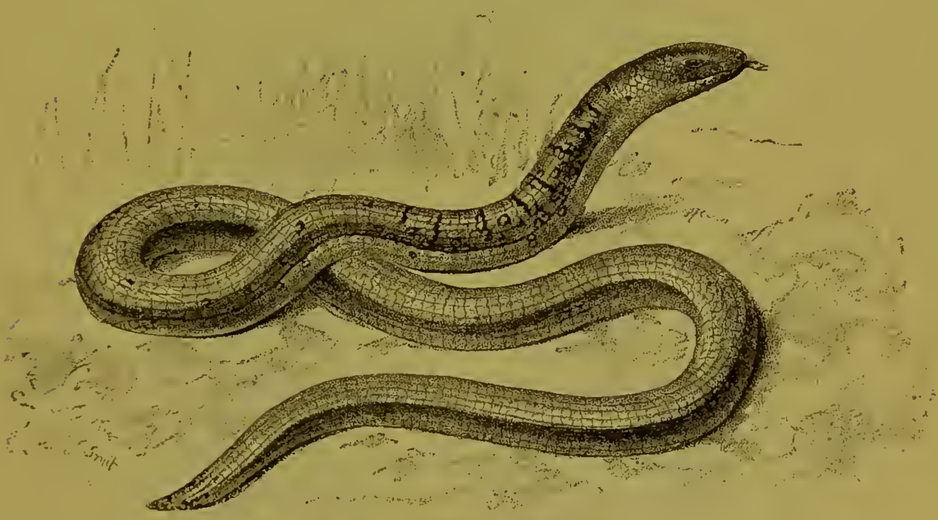


Fig. 47.—*Ophisaurus gracilis.*

Lateral teeth conical; one or two series of teeth on the pterygoids. Azygos præfrontal narrower than the greatest width of the frontal, usually separated from the latter by two or three præfrontals on a transverse series; interparietal broader than the parietals, as broad as the occipital or broader; three shields on a line from the nasal to the azygos præfrontal; five supraoculars. Ear-opening distinct, not larger than the nostril. Dorsal plates keeled, in 14 longitudinal and 100 to 110 transverse series; ventrals smooth, in 10 longitudinal series. No rudiments of limbs externally. Tail about twice as long as head and body; upper caudal scales keeled, lower less distinctly. Brown above, with a darker lateral band, and frequently with irregular transverse series of blue, black-edged spots; lower surface pale brownish or yellowish.

From snout to vent 7 inches.

Hab. Eastern Himalayas, Khási hills, Eastern Bengal, Rangoon, Western Yunnan.

Family V. VARANIDÆ.

Skull with incomplete postorbital and complete postfronto-squamosal bony arches; supratemporal fossa not roofed over; præmaxillary single, narrowed and much produced posteriorly; nasals coalesced, narrow; parietal single; infraorbital vacuity bounded by the pterygoid, palatine, and transverse (transpalatine) bones, the maxillary being excluded; frontals completely surrounding the olfactory lobes of the brain; a fibro-cartilaginous interorbital septum; a columella cranii. Teeth large, dilated at the base, which

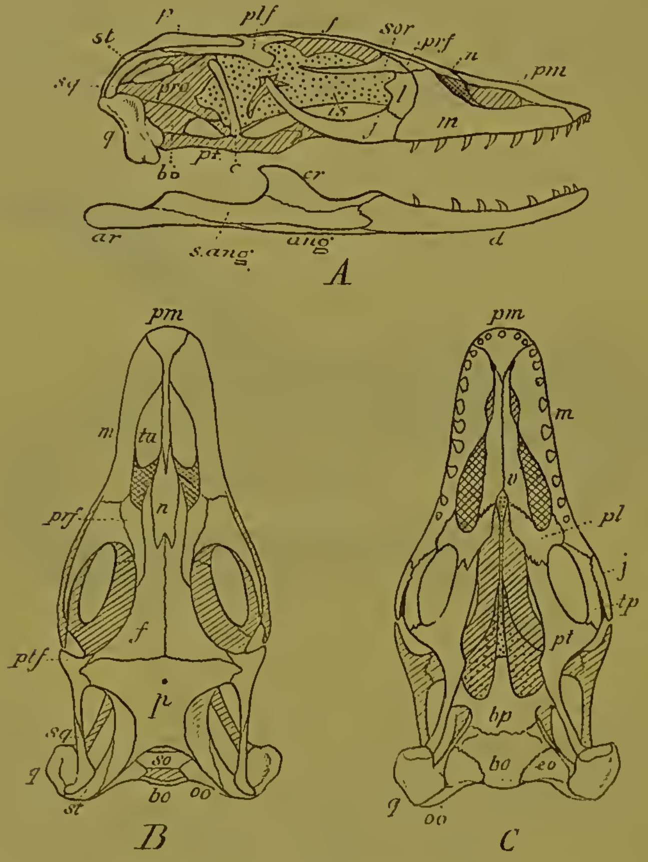


Fig. 48.—Skull of *Varanus griseus*.

A. Side view. *B.* Upper view. *C.* Lower view.

ang. Angular.
ar. Articular.
bo. Basioccipital.
bp. Basisphenoid.
c. Columella cranii.
cr. Coronoid.
d. Dentary.
eo. Exoccipital.
f. Frontal.
is. Interorbital septum.
j. Jugal.
l. Lachrymal.
m. Maxillary.
n. Nasal.
oo. Opisthotic.
p. Parietal.
pl. Palatine.
pm. Præmaxillary.
pro. Prootic.
prf. Præfrontal.
pt. Pterygoid.
ptf. Postfrontal.
q. Quadrate.
s.ang. Supra-angular.
so. Supraoccipital.
sor. Supraorbital.
st. Supratemporal.
sq. Squamosal.
tp. Transpalatine.
tu. Turbinal.
v. Vomer.

is fixed to the inner side of the jaws; palate toothless. No dermal ossifications on the head or body. Clavicle slender, not dilated; interclavicle anchor-shaped. Tongue smooth, very long and slender, bifid, retractile into a sheath at the base. Pupil round; eyelids

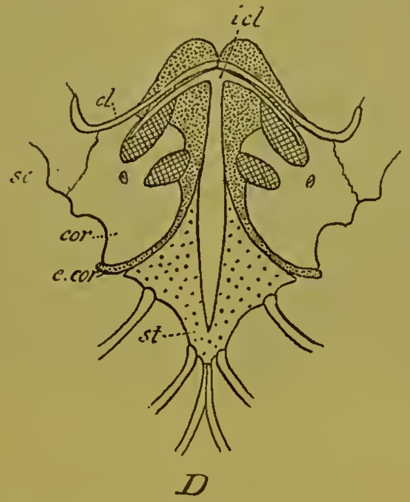


Fig. 49.—Pectoral arch of *Varanus griseus*.

cl. Clavicle. *st.* Sternum. *cor.* Coracoid. *c.cor.* Epicoracoid. *icl.* Interclavicle. *sc.* Scapula.

well developed; ear distinct. Limbs well developed, strong; neck long; tail long, cylindrical or compressed. Head covered with small polygonal scales. Dorsal scales roundish, juxtaposed, surrounded by rings of minute granules; ventral scales squarish, arranged in cross rows. No femoral or præanal pores.

Lizards of large size, carnivorous, terrestrial or aquatic. The yellowish-grey *Varanus griseus* is essentially a desert Lizard; *V. salvator* and *V. niloticus*, with their strongly compressed tails, well deserve the name of 'Water Lizards;' whilst the Papuan emerald-green *V. prasinus* is believed to be arboreal. Eggs oval and soft-shelled.

A single genus.

Genus **VARANUS**,

Merrem, Tent. Syst. Amph. p. 58, 1820.

Of this genus 27 species are known, inhabiting Africa, Southern Asia, Papuasia, and Australia. They are known in English as Monitors; and are called *gho-samp* in Northern India; the young are often called *biscobra*, and are regarded as venomous, probably on account of their having a forked tongue

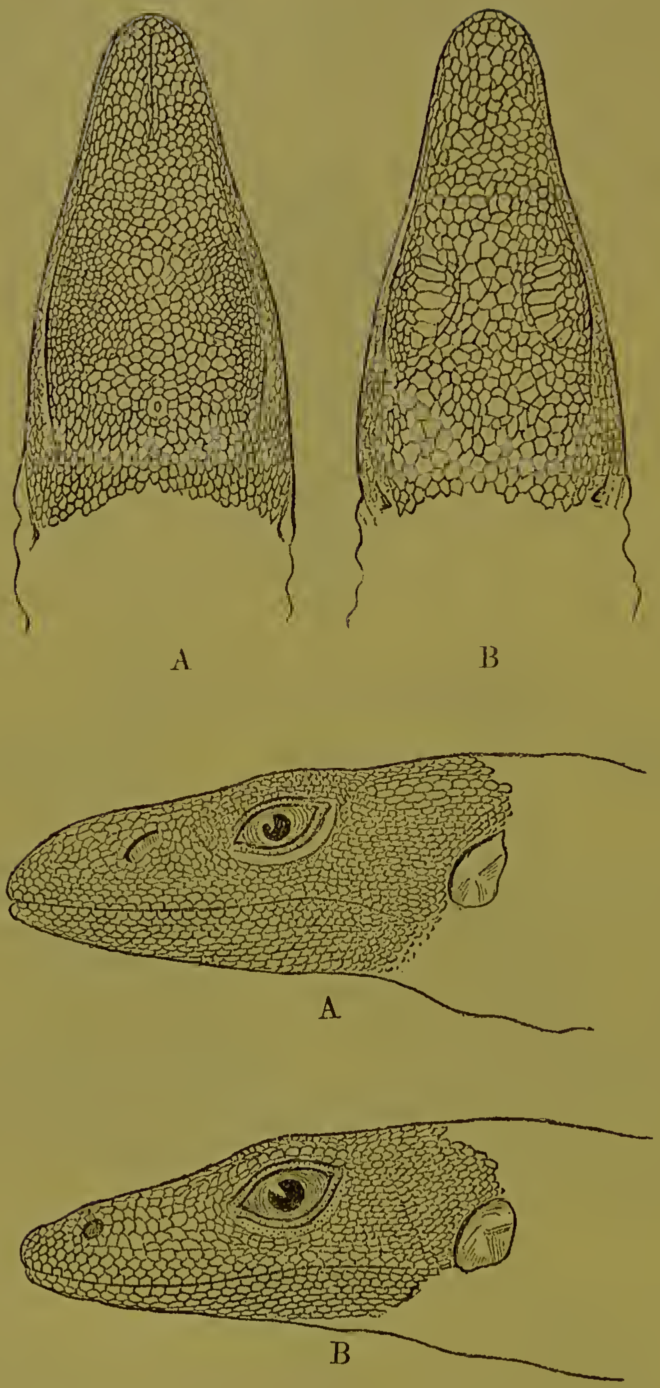


Fig. 50.—Upper and side views of heads of, A. *Varanus bengalensis*, B. *Varanus salvator*.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Nostril an oblique slit (see fig. 50, A), nearer to orbit than to end of snout; tail round or slightly compressed posteriorly .... *V. griseus*, p. 163.

B. Nostril an oblique slit; tail compressed, keeled above.

a. Nostril a little nearer to end of snout than to orbit .... *V. flavescens*, p. 164.

b. Nostril nearer to orbit than to end of snout.

a'. Ventral scales smooth; supraoculars equal (see fig. 50, A); nostril much nearer to orbit than to end of snout .... *V. bengalensis*, [p. 164.

b'. Ventral scales smooth; median supraoculars slightly enlarged transversely (as in fig. 50, B); nostril only a little nearer to orbit than to end of snout........................ *V. nebulosus*, p. 165.

c'. Ventral scales keeled; nuchal scales very large and flat .... *V. dumerilii*, p. 165.

C. Nostril roundish or oval, nearer to end of snout than to orbit (see fig. 50, B); tail compressed, keeled above .... *V. salvator*, p. 166.

182. Varanus griseus.

Tupinambis griseus, *Daud. Rept.* viii, p. 352.

Psammosaurus scincus, *Jerdon, P. A. S. B.* 1870, p. 70; *Theob. Cat.* p. 39.

Varanus ornatus (*non Daud.*), *Carlleyle, J. A. S. B.* xxxviii, 1869, p. 192.

Varanus griseus, *Bouleng. Cat. Liz.* ii, p. 306.

Teeth acute, compressed. Snout depressed at the end, as long as the distance from anterior border of orbit to anterior border of ear; canthus rostralis distinct. Nostril an oblique slit, about four times as distant from end of the snout as from orbit. Digits rather short. Tail round or slightly compressed. Scales of head, including supraoculars, very small, granular, subequal. Scales on upper surface small, smooth or feebly keeled; those on the sides of the neck generally conical in adult specimens. Abdominal scales smooth, in 110 to 125 transverse series (counted from collar-fold to groin). Caudal scales more or less distinctly keeled; no caudal crest. Greyish yellow, sometimes with more or less distinct brown cross bars on the back and tail and brown streaks along the sides of the neck. Young with round yellow spots and dark brown cross bars and temporal and cervical streaks; a few brown lines across the snout and short vertical brown lines on the lower lip.

From snout to vent 1 foot 10 inches; tail 2 feet 4 inches.

Hab. Deserts of North-western India; westwards, through Southern Asia to the Caspian Sea and North Africa.

183. Varanus flavescens.

Monitor flavescens, *Gray, Griff. A. K.* ix, *Syn.* p. 25, *and Ill. Ind. Zool.* ii, pl. lxvii.
Varanus flavescens, *Cantor, J. A. S. B.* xvi, 1847, p. 634; *Günth. Rept. B. I.* p. 65, pl. ix, fig. A; *Theob. Cat.* p. 38; *Bouleng. Cat. Liz.* ii, p. 309.

Teeth subconical, scarcely compressed. Snout short, convex, measuring a little less than the distance from the anterior border of the orbit to the anterior border of the ear; canthus rostralis distinct. Nostril an oblique slit, a little nearer to the end of the snout than to the orbit. Digits short, the length of the fourth toe, measured from its articulation with the tarsus to the base of the claw, not exceeding the length of the femur. Tail feebly compressed, keeled above. Scales of head small, subequal; the median series of supraocular scales slightly dilated transversely. Scales on upper surfaces moderate, oval, keeled. Abdominal scales smooth, in 65 to 75 transverse rows. Caudal scales keeled; the caudal keel with a very low, doubly-toothed crest. Olive or yellowish brown above, with irregular darker markings which are generally confluent into broad cross bars; a blackish temporal streak; lower surfaces yellowish, with rather indistinct brown cross bars, which are most distinct on the throat. Young dark brown above, with yellow spots confluent into cross bars; lower surface yellow, with dark brown cross bars.

From snout to vent 1 foot 3 inches; tail 1 foot 8 inches.

Hab. Northern India, Burma, Malay Peninsula. Terrestrial.

184. Varanus bengalensis.

Tupinambis bengalensis, *Daud. Rept.* iii, p. 67.
Varanus bibronii, *Blyth, J. A. S. B.* xi, 1842, p. 869.
Varanus lunatus, *Gray, Cat. Liz.* p. 10; *Günth. Rept. B. I.* p. 66, pl. ix, fig. C; *Theob. Cat.* p. 38.
Monitor dracæna, *Kelaart, Prodr.* p. 146.
Varanus dracæna, *Günth. l. c.* p. 65, pl. ix, fig. B; *Theob. l. c.*
Varanus bengalensis, *Bouleng. Cat. Liz.* ii, p. 310.

Teeth acute, compressed. Snout high, very convex at the end, as long as the distance from the anterior corner of the eye to the ear; canthus rostralis well marked. Nostril an oblique slit, a little nearer to the orbit than to the tip of the snout. Ear-opening oblique. Digits strong, moderately elongate. Tail compressed, keeled above. Scales of head small, subequal; supraocular scales smaller, subequal. Scales of upper surface of body and limbs small, oval, tectiform on the hinder part of the back. Abdominal scales smooth, in 90 to 110 transverse rows. Caudal scales keeled; caudal keel with a very low, doubly-toothed crest. Upper surface yellowish, brownish, or olive, with more or less numerous blackish dots; a more or less distinct dark streak on the temple; lower

surface yellowish, uniform or dotted with blackish; the dots most numerous on the throat. Young with numerous whitish ocelli frequently alternating with blackish transverse bands, which may persist after the ocelli have disappeared (*V. lunatus*).

From snout to vent $2\frac{1}{2}$ feet; tail $3\frac{1}{2}$.

Hab. The whole of India and Ceylon; Burma? Terrestrial, living in holes, in dry places.

185. Varanus nebulosus.

Monitor nebulosus, *Gray, Griff. A. K.* ix, *Syn.* p. 27.
Varanus nebulosus, *Günth. Rept. B. I.* p. 66, pl. ix, fig. D; *Theob. Cat.* p. 39; *Bouleng. Cat. Liz.* ii, p. 311.

Teeth acute, compressed. Snout rather elevated, pointed, convex, as long as the distance from the anterior corner of the eye to the posterior border of the ear; canthus rostralis distinct. Nostril an oblique slit, half as far from orbit as from end of snout. Ear-opening oblique. Digits moderately elongate. Tail compressed, keeled above. Scales of head small, subequal; supraocular region with a series of four to seven transversely dilated scales. Scales on upper surfaces small, oval, obtusely keeled, those on anterior part of neck larger, subcircular, not keeled. Abdominal scales smooth, in about 80 transverse rows. Caudal scales keeled; the caudal keel with a very low, doubly-toothed crest. Greenish or brownish olive, irregularly marbled and dotted with darker and lighter; chin and throat with transverse blackish bands or marbled with blackish. The young have numerous yellowish ocelli on the back, limbs, and base of tail, and the whole of the lower surfaces marbled with blackish; nape with two posteriorly directed, chevron-shaped, blackish bands, the anterior proceeding from the eyes.

From snout to vent 1 foot 2 inches; tail 2 feet.

Hab. Bengal, Burma, Siam, Malay Peninsula.

186. Varanus dumerilii.

Monitor dumerilii (*Müll.*), *Schleg. Abbild.* p. 78.
Varanus macrolepis, *Blanf. J. A. S. B.* l, 1881, p. 239, pl. xvi.
Varanus dumerilii, *Bouleng. Cat. Liz.* ii, p. 312.

Teeth acute, compressed. Snout depressed at the end, measuring a little more than the distance from the anterior border of the orbit to the anterior border of the ear; canthus rostralis not well marked. Nostril oblique, about half as far from orbit as from tip of snout. Digits moderate. Tail strongly compressed, keeled above. Scales of head moderate, subequal; those in the middle of the supraocular region slightly enlarged transversely. Scales on upper surface of neck very large, about as broad as long, flat, the hindermost slightly keeled; dorsal scales large, oval, keeled; scales above the limbs keeled. Abdominal scales slightly keeled, in 75 to 85 transverse

rows. Caudal scales keeled, the lateral sometimes intermixed with larger ones; the caudal keel with a very low, doubly-toothed crest. Light brown above; a dark temporal streak, from eye to ear, generally confluent with a U-shaped dark marking on the neck; back with very broad dark transverse bars, broader than the interspaces between them; limbs dark brown, spotted with yellow; more or less distinct vertical dark bars on the lips; belly yellowish, uniform or with transverse dark bands.

From snout to vent 1 foot 3 inches.

Hab. Tenasserim, Sumatra, Borneo.

187. Varanus salvator.

Stellio salvator, *Laur. Syn. Rept.* p. 56.
Varanus salvator, *Cantor, J. A. S. B.* xvi, 1847, p. 635; *Bouleng. Cat. Liz.* ii, p. 314.
Hydrosaurus salvator, *Günth. Rept. B. I.* p. 67, pl. ix, fig. E; *Theob. Cat.* p. 39.

Teeth acute, compressed. Snout depressed at the tip, long, the distance from that point to the anterior corner of the eye being generally a little greater than the distance from the latter to the anterior border of the ear; canthus rostralis obtuse. Nostril oval, at least twice as far from the orbit as from the tip of the snout. Digits moderate. Tail strongly compressed, keeled above. Scales of head moderate, subequal, larger than those on the temples; supraocular region with a series of 4 to 8 large transversely dilated scales. Scales on upper surfaces small, oval, keeled; abdominal scales keeled, in 85 to 95 transverse rows. Caudal scales keeled; the caudal ridge with a very low, doubly-toothed crest. Dark brown or blackish above, with yellow spots or ocelli; snout generally lighter, with transverse black bars, most distinct on the lips, and continued across the chin; a black temporal band, commencing from the eye and bordered by a yellow band which sometimes extends along the side of the neck; lower surfaces yellow. The markings most accentuated in the young.

From snout to vent 3 feet 4 inches.

Hab. Bengal, Ceylon, S. China, Burma, Malay Peninsula and Archipelago. Found in marshy localities or on trees overhanging rivers; enters the water readily.

Family VI. LACERTIDÆ.

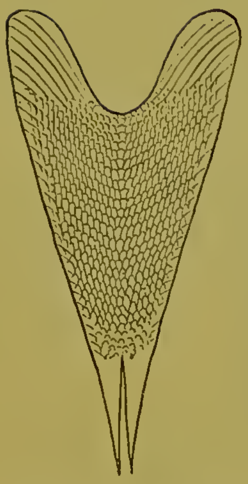


Fig. 51.—Tongue of *Acanthodactylus cantoris.*

Skull with bony postorbital and post fronto-squamosal arches; præmaxillary single; nasals distinct; parietal single; a fibro-cartilaginous interorbital septum; a columella cranii. Skull with bony dermal plates, roofing over the supratemporal fossæ. Dentition pleurodont. Clavicle dilated and perforated proximally; interclavicle cruciform. Tongue flat, elongate, bifid in front and behind, covered with rhomboidal scale-like papillæ or overlapping plicæ converging forwards. Limbs well developed. Tail long, fragile. Pupil round; eyelids well developed. Ear distinct. Femoral pores usually distinct. Head with symmetrical shields. Dorsal scales juxtaposed or imbricate, usually smaller than the ventrals, which form longitudinal and transverse series.

Distribution. Europe, Asia, and Africa. In the Indian Region the species are but few in number.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Inguinal, but no femoral pores; dorsal scales large and keeled; flanks granular. — TACHYDROMUS, p. 168.

B. Femoral pores.

- *a.* Nostrils pierced between two nasals and the first labial; digits fringed laterally. — ACANTHODACTYLUS, [p. 170.
- *b.* Nostril not touching the first labial.
  - *a'.* Lower eyelid with a very large transparent disk, through which the eye is entirely visible; dorsal scales pointed, imbricate, and strongly keeled.
    - *a''.* Lower eyelid distinct from the rudimentary upper . . . . CABRITA, p. 171.
    - *b''.* No movable eyelids, the lower having fused with the upper . . . . OPHIOPS, p. 173.
  - *b'.* Lower eyelid scaly or with a small transparent disk; dorsal scales granular.
    - *a''.* Digits not fringed laterally . . . . . . EREMIAS, p. 176.
    - *b''.* Digits fringed laterally . . . . SCAPTEIRA, p. 179.

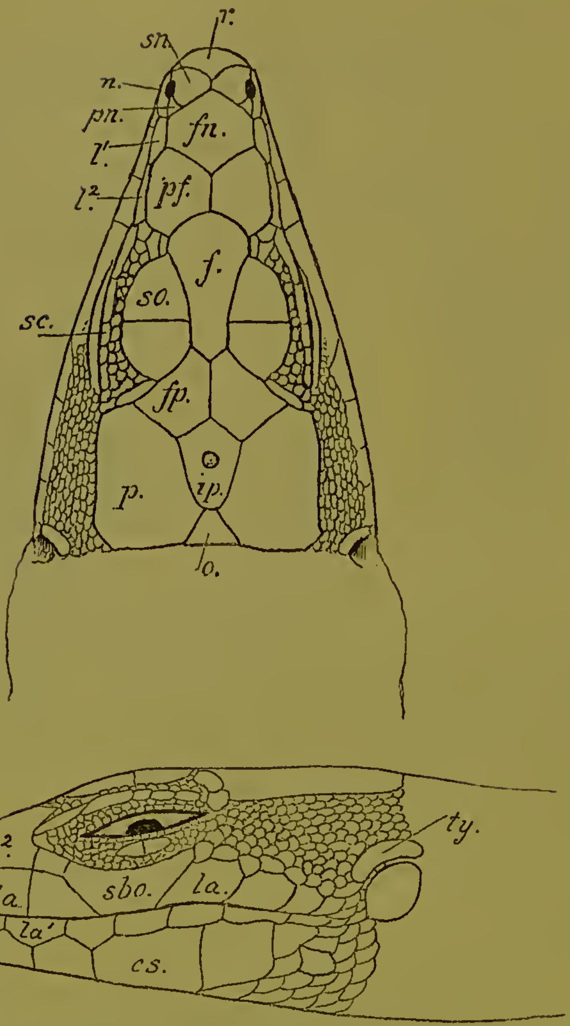


Fig. 52.—Upper and side views of head of *Eremias guttulata*, to explain the nomenclature of the shields.

cs. Chin-shields.
f. Frontal.
fn. Frontonasal.
fp. Frontoparieta
ip. Interparietal.
l^1, l^2. Loreals.
la. Upper labials.
la'. Lower labials.
m. Mental.
n. Nasal.
o. Occipital.
p. Parietal.
pf. Præfrontal.
pn. Postnasal.
r. Rostral.
sbo. Subocular.
sc. Supraciliaries.
sn. Supranasal.
so. Supraocular.
ty. Tympanic.

Genus TACHYDROMUS,

Daudin, Rept. iii, p. 251, 1802.

Head-shields normal*. Nostril pierced between two nasals and

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* *I. e.* a frontonasal, a pair of præfrontals, a frontal, a pair of frontoparietals, a pair of parietals, an interparietal, and an occipital.

the first labial. Lower eyelid scaly. Collar more or less distinct. Back covered with large, rhomboidal, keeled shields forming longitudinal series; flanks granular; ventral shields rhomboidal, imbricate, all or part keeled. Digits subcylindrical, with smooth, tubercular subdigital lamellæ, the distal lamellæ much enlarged. Inguinal pores; no femoral pores. Tail extremely long, cylindrical.

Distribution. Eastern Asia; Japan; Indian archipelago. Four species are known.

Synopsis of Indian and Burmese Species.

First large supraocular in contact with loreal	*T. sexlineatus*, p. 169.
A small shield between supraocular and loreal	*T. tachydromoides*, p. 169.

188. Tachydromus sexlineatus.

Tachydromus sexlineatus, *Daud. Rept.* iii, p. 356, pl. xxxix; *Günth. Rept. B. I.* p. 69, pl. viii, fig. C; *Theob. Cat.* p. 41; *Bouleng. Cat. Liz.* iii, p. 4.

Tachydromus meridonalis, *Günth. l. c.* p. 70, pl. viii, fig. D.

Tachydromus sikimmensis, *Günth. A. M. N. H.* (6) i, 1888, p. 168.

Supraoculars in contact with the supraciliaries; the large anterior supraocular in contact with the loreal; temporal scales strongly keeled. 6 or 8 longitudinal series of strongly keeled shields on the nape, four on the back, median pair largest; 10 or 12 longitudinal series of strongly keeled ventral shields (lateral series included). 1 to 6 inguinal pores on each side. Greenish or brownish above, with metallic gloss; a more or less distinct whitish, black-edged streak from the supraciliary edge along each side of the back to the base of the tail; the black band bordering the light streak beneath begins on the loreal region and passes through the eye and above the tympanum; sometimes two narrow black lateral lines instead of the black band; sides frequently with small round light spots; lower surfaces yellowish or greenish.

From snout to vent 2·5 inches; tail 11.

Hab. Southern China, Eastern Himalayas, Assam, Burma, Indo-China, Java, Borneo.

189. Tachydromus tachydromoides.

Lacerta tachydromoides, *Schleg. Faun. Japon. Rept.* p. 101, pl. i, figs. 5–7.

Tachydromus japonicus, *Günth. Rept. B. I.* p. 69.

Tachydromus septentrionalis, *Günth. l. c.* p. 70, pl. viii, fig. E.

Trachydromus haughtonianus, *Jerdon, P. A. S. B.* 1870, p. 72; *Theob. Cat.* p. 41.

Tachydromus tachydromoides, *Bouleng. Cat. Liz.* iii, p. 5.

Head shorter than in *T. sexlineatus*. A series of granules

between the supraoculars and the supraciliaries; a small shield separates the large anterior supraocular from the loreal; temporal scales obtusely keeled. Dorsal shields very variable in number and in size, very strongly keeled; they usually form 6 to 8 series, of which the median are as a rule the smallest; sometimes only five series on the posterior half of the body; 8 or 10 series of large ventrals, which are either all strongly keeled or only the outer rows; 2 to 4 longitudinal rows of smaller keeled shields on each side of the ventrals. One or two inguinal pores on each side. Greenish or brownish above, with or without a light black-edged dorso-lateral band as in *T. sexlineatus*; a more or less distinct light streak from below the eye to the shoulder, sometimes extending along the side of the body; lower surfaces yellowish or greenish.

From snout to vent 2·5 inches; tail 8.

Hab. Japan, China, Assam.

Genus **ACANTHODACTYLUS**,

Wiegmann, Herp. Mex. p. 10, 1834.

Head-shields normal, occipital absent. Nostril pierced between two nasals and the first labial. Lower eyelid scaly. Collar more or less distinct. Dorsal scales juxtaposed or imbricate; ventrals smooth, slightly imbricate. Digits keeled beneath and more or less strongly fringed laterally. Femoral pores. Tail subcylindrical.

Distribution. South of Spain and Portugal; Africa north of the equator; South-western Asia eastwards to the Punjab. 10 species are known.

These are true Sand-Lizards. Their movements are very quick.

Synopsis of Indian Species.

Not more than 16 longitudinal rows of keeled scales between the hind limbs .... *A. cantoris*, p. 170.
Posterior dorsal scales much smaller than the caudals .... *A. micropholis*, p. 171.

190. **Acanthodactylus cantoris.**

Acanthodactylus cantoris, *Günth. Rept. B. I.* p. 73; *Theob. Cat.* p. 42; *Blanf. E. Persia, Zool.* p. 381, pl. xxvi, fig. 3; *Murray, Zool. Sind*, p. 348; *Bouleng. Cat. Liz.* iii, p. 60.
? Acanthodactylus micropholis (*non Blanf.*), *Murray, l. c.*

Snout acutely pointed. Four supraoculars; subocular not reaching the lip; temporal scales keeled; front edge of the ear usually rather feebly, but distinctly, denticulated. Dorsal scales strongly keeled, very much larger on the hinder part of the back than between the shoulders and on the flanks, rhomboidal, strongly imbricate; 10 to 16 large keeled scales on a transverse line between the hind limbs. Ventral plates usually broader than long, in straight longitudinal and slightly angular transverse series; 12 or 14 plates

across the middle of the body. Usually a median series of broad præanals, the posterior largest. The hind limb reaches the ear or the eye. 17 to 23 femoral pores on each side. Digital denticulations strong, usually as long as the diameter of the corresponding part of the toe, much more developed on the outer than on the inner edge of the fourth toe. Upper caudal scales strongly keeled; basal subcaudals smooth or obtusely keeled. Greyish or buff above, with or without small blackish spots; young with whitish longitudinal lines separated by blackish interspaces with series of round whitish spots, which markings gradually become more indistinct; tail pink in the young.

From snout to vent 2·75 inches; tail 6.

Hab. North-western India, from Agra to Sind, Baluchistan, South-eastern Persia.

191. Acanthodactylus micropholis.

Acanthodactylus micropholis, *Blanf. A. M. N. H.* (4) xiv, 1874, p. 33; *id. E. Persia, Zool.* p. 383, pl. xxvi, fig. 2; *Bouleng. Cat. Liz.* iii, p. 63.

Snout obtuse. Three supraoculars, the fourth being broken up into granules, the first usually separated from the second by a series of granules; subocular usually bordering the lip; temporal scales smooth; front edge of the ear very feebly denticulated. Dorsal scales more or less strongly keeled, very small on the nape, gradually increasing in size towards the posterior part of the back, where they are very much smaller than the caudals, rhomboidal, feebly imbricate. Ventral plates broader than long, in 10 longitudinal series. Præanals usually small, irregular or with a median series transversely enlarged. The adpressed hind limb reaches the tympanum or the eye. 21 to 27 femoral pores on each side. Digital denticulations moderately developed, much shorter than the diameter of the corresponding part of the toe, usually more developed on the outer than on the inner edge of the fourth toe. Upper caudal scales keeled; basal subcaudals smooth or obtusely keeled. Grey above, with white longitudinal lines on the body and round spots on the limbs; the interspaces between the light lines frequently blackish, with a series of small round white spots.

From snout to vent 2·4 inches; tail 5.

Hab. Baluchistan; South-eastern Persia.

Genus CABRITA,

Gray, Ann. N. H. i, 1838, p. 282.

Head-shields normal. Nostril pierced between two or three nasals. Lower eyelid distinct from the rudimentary upper, and having a very large transparent disk. Collar absent. Dorsal scales imbricate and strongly keeled. Ventral plates imbricate,

smooth. Digits compressed, with sharply keeled scales beneath. Femoral pores. Tail cylindrical.

Distribution. India, Ceylon, inhabiting wooded country as a rule.

Synopsis of Indian Species.

Anterior labials keeled, forming a projecting margin; occipital present. . . . . *C. leschenaultii*, p. 172.
Labials not keeled; no occipital . . . . *C. jerdonii*, p. 173.

192. Cabrita leschenaultii.

Lacerta leschenaultii, *M.-Edw. Ann. Sc. Nat.* xvi, 1829, pp. 80, 86, pl. vi, fig. 9.
Cabrita brunnea, *Gray, Ann. N. H.* i, 1838, p. 282; *Theob. Cat.* p. 42.
Cabrita leschenaulti, *Günth. Rept. B. I.* p. 71; *Theob. l. c.*; *Bouleng. Cat. Liz.* iii, p. 70.

Upper head-shields strongly keeled and striated; anterior labials keeled, forming a projecting margin; canthus rostralis very strong; nostril in the horizontal suture between two large nasals which are extensively in contact with the rostral, and followed by one or two small postnasals, the upper of which sometimes enters the nostril; no azygos præfrontal; frontal long and narrow; a small occipital; 4 supraoculars, first and fourth small, the two principal separated from the supraciliaries by a series of granules; subocular bordering the lip, between the fourth and fifth (or fifth and sixth) upper labials; temporal scales small, keeled; two large shields border the parietals exteriorly; a curved large shield on the supero-anterior border of the ear-opening; six large chin-shields on each side, the three anterior in contact with their fellows. Dorsal scales moderately large, scarcely larger on the back than on the sides; ventrals broader than long, in 6 longitudinal and 25 to 29 transverse series, the median longitudinal series narrower than the others; 42 to 48 scales round the middle of the body, ventrals included. A large postero-median præanal plate. The hind limb reaches the antehumeral fold or a little beyond the ear; the length of the foot equals the distance between the antehumeral fold and the nostril or the tip of the snout. 12 to 16 femoral pores on each side. Tail nearly twice as long as head and body; caudal scales much larger than dorsals. Brownish or golden above; a pale band, edged above with a black one, along each side of the body and tail, commencing from the supraciliary edge; another pale, black-edged band along the upper lip and side of the body; the space between the two light bands on each side usually black, or spotted with black; lower surfaces yellowish-white, tail and hind limbs often reddish.

From snout to vent 2 inches; tail 4.

Hab. Peninsular India as far north as S.E. Berar and Chánda; Ceylon.

193. Cabrita jerdonii.

Cabrita jerdonii, *Beddome, Madras Monthly Journ. Med. Sc.* 1870, p. 34; *Theob. Cat.* p. 42; *Bouleng. Cat. Liz.* iii, p. 71.

Differs from the preceding in the following points:—A single anterior nasal, followed by two postnasals; labials not keeled, no projecting labial margin; usually one or two small azygos shields between the pair of præfrontals; no occipital. Dorsal scales as large as the caudals, much larger than the laterals; ventral plates subequal; 27 to 30 scales round the middle of the body. The length of the foot is less than the distance between the antehumeral fold and the nostril. Femoral pores 11 to 15. Brownish or golden above, with two light lateral bands as in *C. leschenaultii*, which are, however, not bordered with black bands, but with longitudinal series of black spots; lips, and frequently also the throat, speckled with black.

Hab. Godávari valley, extending north to Chutia Nagpur, and south to Cuddapah.

Genus OPHIOPS,

Ménétriés, Cat. Rais. p. 63, 1832.

Head-shields normal. Nostril pierced between two to four nasals. Eyelids immovable, the lower united with the upper, with a very large transparent disk. Collar absent or very indistinct. Dorsal scales imbricate and strongly keeled. Ventral plates imbricate, smooth. Digits compressed, with sharply keeled scales beneath. Femoral pores. Tail cylindrical.

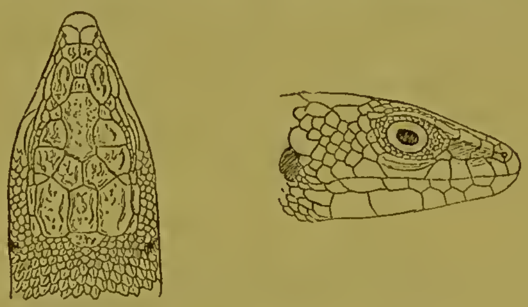

Fig. 53.—Head of *Ophiops beddomii.*

Distribution. North Africa, Turkey, South-western Asia, India. 6 species are known.

Synopsis of Indian Species.

A. Upper head-scales rugose, keeled and striated; 28 to 35 scales round middle of body (ventrals included).
- *a.* A single frontonasal .... *O. jerdonii*, p. 174.
- *b.* Two or three frontonasals .... *O. beddomii*, p. 174.

B. Upper head-scales smooth.
  a. Snout moderate; 30 to 40 scales round the body (ventrals included).............. *O. elegans*, p. 175.
  b. Snout long, much depressed; 52 to 64 scales round the body .... *O. microlepis*, p. 175.

194. Ophiops jerdonii.

Ophiops jerdoni, *Blyth, J. A. S. B.* xxii, 1853, p. 653; *Theob. Cat.* p. 44; *Bouleng. Cat. Liz.* iii, p. 73.
Pseudophiops theobaldi, *Jerdon, P. A. S. B.* 1870, p. 71.
Cabrita leschenaultii, *Murr. Zool. Sind*, p. 347.
Calosaura chaperi, *Sauvage, Bull. Soc. Philom.* (7) viii, 1884, p. 142.

Head moderate, feebly depressed. Upper head-shields rugose, keeled and striated; nostril lateral, pierced between 3 or 4 shields, viz. an anterior, or an upper and a lower anterior nasal and two superposed postnasals; a large frontonasal; frequently one or two small azygos shields between the pair of præfrontals; four supra-oculars, first and fourth small, the two principal separated from the supraciliaries by a series of granules; occipital small, sometimes a little broader than the interparietal, with which it forms a suture; subocular bordering the lip, between the fourth and fifth (or third and fourth) upper labials; temporal scales small, keeled; one or two large supratemporal shields border the parietals externally; tympanic shield small or indistinct. No gular fold extending from ear to ear; collar quite indistinct. Dorsal scales large, strongly keeled, much imbricate, scarcely larger on the back than on the sides; 28 to 35 scales round the middle of the body (ventrals included). A large postero-median præanal plate. The hind limb reaches the shoulder or halfway between the latter and the ear in the male, not to axilla in the female. 7 to 11 femoral pores on each side. Tail once and a half to twice as long as head and body; caudal scales about as large as dorsals. Coppery-brown above, with two pale golden lateral streaks bordered with black, the upper extending from the supraciliaries to the tail, the lower from the upper lip to the groin; frequently a series of large black spots between the two lateral streaks; lower surfaces yellowish white.

From snout to vent 1·65 inches; tail 3·2.

Hab. Central India (Saugor, Mhow), N.W. Provinces (Agra), Punjab, Sind, also Madras Presidency (Bellary).

195. Ophiops beddomii.

Pseudophiops beddomei, *Jerdon, P. A. S. B.* 1870, p. 72.
Ophiops monticola, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 45.
Ophiops beddomii, *Bouleng. Cat. Liz.* iii, p. 74, pl. iii, fig. 3.

Very closely allied to the preceding. Two or three frontonasals on a transverse line; one or two azygos præfrontals nearly always present; first and fourth supraoculars usually broken up into

several very small shields or granules. Lateral scales distinctly smaller than dorsals; 28 to 32 scales round the body. Femoral pores 8 to 13. Coloration as in *O. jerdonii*, but the upper lateral light streak frequently absent.

Hab. Wynaad (5000 feet), S. Canara, Khandála near Bombay.

196. **Ophiops elegans.**

Ophiops elegans, *Ménétr. Cat. Rais.* p. 63; *Blanf. Zool. E. Pers.* p. 367; *Bouleng. Cat. Liz.* iii, p. 75.
Gymnops meizolepis, *Stoliczka, P. A. S. B.* 1872, p. 124.
Ophiops meizolepis, *Blanf. l. c.* p. 369, pl. xxv, fig. 2; *Theob. Cat.* p. 47.

Head moderate, feebly depressed. Upper head-shields smooth or slightly rugose; nostril lateral, pierced between an upper and a lower nasal, and followed by one or two postnasals; frontonasal single; four supraoculars, first and fourth very small, the two principal separated from the supraciliaries by a series of granules: occipital small, in contact with or separated from the interparietal; subocular bordering the lip, normally between the fourth and fifth upper labials; temporal scales small, smooth; usually two large supratemporal shields bordering the parietal; a large tympanic shield. A gular fold may be distinguishable; collar absent or feebly marked. Dorsal scales variable in size, as large as or larger than the laterals; 30 to 40 scales round the middle of the body, ventrals included. A more or less enlarged postero-median præanal plate. The hind limb reaches about the ear in the male, the shoulder or a little beyond in the female. 7 to 12 (usually 9 to 11) femoral pores on each side. Tail about twice as long as head and body. Olive or bronzy above, with black spots usually forming longitudinal series, sometimes forming a network; frequently one or two light longitudinal streaks on each side; lower surfaces white.

From snout to vent 2 inches; tail 4.

Hab. Turkey, Caucasus, Asia Minor, Syria, Persia, Punjab.

197. **Ophiops microlepis.**

Ophiops microlepis, *Blanf. J. A. S. B.* xxxix, 1870, p. 351, pl. xv, figs. 1–5; *Theob. Cat.* p. 46; *Bouleng. Cat. Liz.* iii, p. 77.

Head much depressed; snout long; loreal region concave; upper labials projecting, angular. Upper head-shields smooth; nostril latero-superior, pierced between an upper and a lower nasal; a small postnasal wedged in between the two nasals; these three shields more or less distinctly swollen; frontonasal single; præfrontals obtusely keeled; frontal much narrowed posteriorly, grooved longitudinally; four supraoculars, first and fourth smallest, the two principal separated from the supraciliaries by a series of granules; occipital small, broader than the interparietal, with

which it is usually in contact; subocular bordering the lip, between the fourth and fifth upper labials; temporal scales small, obtusely keeled; two large supratemporals bordering the parietal; tympanic shield very large, opercle-like. No gular fold; collar usually distinguishable. Dorsal scales small, as large as laterals or slightly larger; 52 to 64 scales round the middle of the body, ventrals included. Ventrals in 6 longitudinal series. A large postero-median præanal plate. The hind limb reaches the ear, or between the latter and the eye. 13 to 16 femoral pores on each side. Tail about twice as long as head and body; caudal scales very large. Brown or greyish above, with small black spots which may form a network on the sides; usually one or two pale longitudinal streaks on each side; lower surfaces white.

From snout to vent 2·5 inches; tail 5·5.

Hab. Northern India; Cutch; Kurhurbaree (Bengal); Bilāspur.

Genus **EREMIAS**,

Wiegmann, Herp. Mex. p. 9, 1834.

Head-shields normal; occipital often absent. Nostril pierced between three or four nasals. Lower eyelid scaly, or with a small transparent disk. Collar more or less distinct. Dorsal scales small, juxtaposed or imbricate; ventral shields feebly imbricate, smooth. Digits subcylindrical or compressed, with keeled lamellæ beneath. Femoral pores. Tail cylindrical.

Of this essentially African and Central Asian genus, of which 25 species are known, only a few representatives occur in the North-western area of our fauna.

Synopsis of Indian Species.

A. Ventral plates in straight longitudinal series; lower nasal resting on first labial only.
  - *a.* Ventral plates in 10 longitudinal series; occipital in contact with interparietal . . *E. guttulata*, p. 177.
  - *b.* Ventral plates in 12 longitudinal series; occipital separated from interparietal . . *E. brevirostris*, p. 177.

B. Ventral plates forming oblique longitudinal series; lower nasal resting on the two or three anterior labials; no occipital.
  - *a.* Length of foot in adult less than distance between collar-fold and nostril; 50 to 65 scales (counting from ventrals) across middle of body . . . . *E. velox*, p. 178.
  - *b.* Length of foot equals distance between collar-fold and nostril or end of snout; 45 to 50 scales across middle of body . . *E. fasciata*, p. 179.

198. Eremias guttulata.

Lacerta guttulata, *Licht. Verz. Doubl. Mus. Berl.* p. 101.
Eremias (Mesalina) watsonana, *Stoliczka, P. A. S. B.* 1872, p. 86; *Theob. Cat.* p. 43; *Murr. Zool. Sind*, p. 349.
Mesalina pardalis, *Blanf. Zool. E. Pers.* p. 377; *Murr. l. c.* p. 350.
Eremias guttulata, *Bouleng. Cat. Liz.* iii, p. 87.

Snout rather pointed. Nasals more or less swollen; frontonasals separated from the rostral by the upper nasals; 2 præfrontals; 4 supraoculars, first and fourth very small, sometimes broken up, the first in contact with the loreal; a series of granules between the two principal supraoculars and the supraciliaries; interparietal pentagonal, in contact with a small occipital; temporal scales granular, smooth; no auricular denticulation; lower eyelid with a more or less transparent disk formed usually of two, not unfrequently of several scales, seldom of one; subocular bordering the lip, normally between the fourth and fifth upper labials; the three anterior pairs of chin-shields in contact. A more or less marked transverse gular fold, connecting the ears; collar curved or more or less angular, free or attached (sometimes indistinct) in the middle, formed of 8 to 11 plates. Dorsal scales roundish, convex, smooth, juxtaposed, 40 to 55 across the middle of the body; ventral plates in straight longitudinal and transverse series, broader than long; in 10 longitudinal series, the outer series composed of very small plates. Normally a large præanal plate, bordered by two semicircles of smaller ones. The hind limb reaches the shoulder or not so far in the female, the shoulder or halfway between the shoulder and the ear in the male; foot as long as the distance between the arm and the anterior border of the orbit or the centre of the eye; one series of large, or two of small, subtibial plates. 10 to 17 femoral pores. Tail once and a half to twice the length of the head and body; upper caudal scales strongly keeled; basal subcaudals smooth or very obtusely keeled. Greyish or rufous-brown above, with very variable markings; series of black spots and white ocelli, or series of more or less confluent blackish spots along the body; some specimens with irregularly scattered blackish dots, or with regular blackish and white longitudinal lateral bands; others with a broad dark grey vertebral band with a series of shaft-like blackish marks on each side of it, &c.; lower surface white.

From snout to vent 2 inches; tail 4.

Hab. North Africa; South-western Asia, from Arabia and Syria to Afghanistan and Sind.

199. Eremias brevirostris.

Eremias watsonanus, *Stoliczka, P. A. S. B.* 1872, p. 125 (*nec ante*, p. 86).
Mesalina brevirostris, *Blanf. A. M. N. H.* (4) xiv, 1874, p. 32; *id. Zool. E. Persia*, p. 379; *Theob. Cat.* p. 43.
Eremias brevirostris, *Bouleng. Cat. Liz.* iii, p. 89.

Very closely allied to *E. guttulata*. Snout shorter, nasals strongly swollen; interparietal not in contact with the occipital, which is minute. Ventrals in 12 longitudinal series, only the two median distinctly broader than long.

Hab. Tumb Island, Persian Gulf; Punjab.

200. Eremias velox.

Lacerta velox, *Pallas, Reise*, i, p. 457.
Eremias velox, *Blanf. Zool. E. Pers.* p. 374; *Bouleng. Cat. Liz.* iii, p. 97.
Eremias persica, *Blanf. l. c.* p. 370, pl. xxvi, fig. 1.

Head moderate; snout rather obtuse. Nasals swollen, the lower usually in contact with the rostral; frontonasal separated from the rostral; two præfrontals (occasionally with a small additional median shield); two large supraoculars, with a smaller one in front and behind, which are frequently broken up into small scales or granules; the length of the first principal supraocular equals or exceeds its distance from the loreal; the supraoculars usually in contact with the frontal; interparietal small; no occipital; temporal scales granular, smooth; no auricular denticulation; lower eyelid scaly; subocular bordering the lip, usually between the sixth and seventh upper labials; the two or three first labials in contact with the lower nasal. A more or less distinct transverse gular fold, connecting the ears; collar slightly curved, perfectly free, with 9 to 11 plates. Dorsal scales granular, round, juxtaposed, perfectly smooth, 50 to 65 across the middle of the body. Ventral plates forming more or less regular oblique longitudinal, and slightly angular transverse series; the longest transverse series contain 14 or 16 plates, which are as long as broad or a little longer than broad. Præanal scales usually small and irregular, sometimes with a much enlarged posterior shield. The adpressed hind limb usually reaches the collar, or between the latter and the ear, in some female specimens not beyond the axil; foot as long as the distance between the arm and the centre of the eye, or the anterior border of the orbit; an outer series of large subtibial shields, which are more than thrice the size of the others. 17 to 25 femoral pores on each side, the two series sometimes nearly meeting in the middle. Tail once and a half to twice as long as head and body; upper caudal scales, at the base, more or less distinctly keeled, or smooth; basal subcaudals smooth. Young blackish above, with whitish longitudinal lines along the back, and round whitish spots on the sides and limbs; these markings usually disappear more or less completely in the adult, which are greyish or brownish, spotted or longitudinally streaked with black, with or without round whitish spots on the back, sides, and limbs; sometimes a series of large blue and black ocelli on each side; lower surface white, tail pink in the young.

From snout to vent 2·8 inches; tail 5.

Hab. Southern Russia, Transcaucasia, Turkestan, Persia, Baluchistan, Afghanistan.

201. Eremias fasciata.

Eremias fasciata, *Blanf. A. M. N. H.* (4) xiv, 1874, p. 32; *id. Zool. E. Persia*, p. 374, pl. xxv, fig. 3; *Bouleng. l. c.* p. 99.

Very closely allied to the preceding, but smaller and more slender. Head-shields and temporal granules flatter; supraoculars frequently bordered internally by a series of granules; lower nasal constantly resting on the three anterior labials; subocular between the sixth and seventh labials; 45 to 50 dorsal scales across the middle of the body. The adpressed hind limb reaches the collar in the female, slightly beyond the ear in the male; the length of the foot equals the distance from the collar-fold to the nostril or the end of the snout. 16 to 19 femoral pores on each thigh. Upper caudal scales distinctly but obtusely keeled. Body pale brown to white above, with from six to eight longitudinal dark-brown bands as wide as the interspaces between them; limbs dark brown, with large round white spots; lower parts white.

From snout to vent 2 inches.

Hab. Southern Persia and Baluchistan.

Genus SCAPTEIRA.

Wiegmann, Herp. Mex. p. 9, 1834.

Head-shields normal. Nostril pierced between three nasals. Lower eyelid scaly. Collar distinct. Dorsal scales small; ventral shields feebly imbricate, smooth. Digits compressed or depressed, smooth or keeled beneath, fringed laterally. Femoral pores. Tail cylindrical.

9 species are known, which are confined to the desert districts of Central Asia and South Africa. The following species has recently been discovered in Northern Baluchistan.

202. Scapteira acutirostris.

Scapteira acutirostris, *Bouleng. Cat. Liz.* iii, p. 114, *and Tr. Linn. Soc.* (2) v, 1889, p. 100, pl. ix, fig. 4.

Snout conical, acutely pointed; loreal region nearly vertical. Nasals slightly swollen, lower not reaching the rostral, upper forming a long median suture; frontal grooved anteriorly; three large supraoculars, forming sutures with one another, the first in contact with the first supraciliary, the second loreal, the præfrontal, and the frontal; second and third supraoculars separated from the supraciliaries and from the frontal by a series of granules; two or

three minute granules between the first and second supraoculars; a small band-like posterior supraocular, separated from the others by granules; interparietal pentagonal; no occipital; parietals forming a suture behind the interparietal; no enlarged scales on the outer border of the parietals; temporal scales granular, smooth; no auricular denticulation; subocular not reaching the lip, resting on the fifth, sixth, and seventh upper labials; the three anterior pairs of chin-shields in contact. Collar straight, the marginal scales feebly enlarged. Dorsal scales minutely granular, smooth, equal. Ventrals equilateral or longer than broad, in oblique longitudinal series; 35 transverse series, the longest of which contain about 20 plates. A very large præanal plate, about twice as broad as long. The adpressed hind limb reaches the posterior border of the orbit; foot as long as the distance between the arm and the anterior loreal; digits flattened, smooth or distinctly keeled beneath, strongly fringed laterally; the ungual lamellæ much enlarged, forming a suboval disk; a series of large transverse subtibial shields. 15–17 femoral pores. Upper caudal scales feebly keeled. Sand-coloured above, with blackish network; head with symmetrical black markings; lower surfaces white.

From snout to vent 1·3 inches (young).

Hab. A single specimen was obtained between Nushki and the Helmand, in Northern Baluchistan.

Family VII. SCINCIDÆ.

Skull with bony postorbital and postfronto-squamosal arches; præmaxillaries distinct; nasals distinct; parietal single; a fibro-cartilaginous interorbital septum; a columella cranii. Skull with bony dermal plates, roofing over the supratemporal fossæ. Dentition pleurodont. Clavicle dilated, usually perforated proximally; inter-clavicle unciform. Tongue flat, bifid behind, nicked in front, covered with rhomboidal scale-like papillæ. Limbs more or less developed, or absent. Tail usually long, fragile. Pupil round. No femoral pores. Body protected by bony plates underlying the scales, which are cycloid-hexagonal, rhomboidal, imbricate, arranged quincuncially; the bony plates provided with symmetrical tubules, which usually consist of a transverse one anastomosing with several longitudinal ones.

Scincoids are cosmopolitan, the bulk occurring in Australia, the islands of the Pacific, the East Indies, and Africa. They are, as far as we know, ovoviviparous, with the exception of *Mabuia macularia*, which, according to Theobald, is oviparous.

This family includes terrestrial and arboreal forms. The limbs are often rudimentary or absent, but there is every possible gradation in their development; series of species united in one genus often showing a complete passage from a well-developed pentadactyle limb to a rudiment not distinguishable externally.

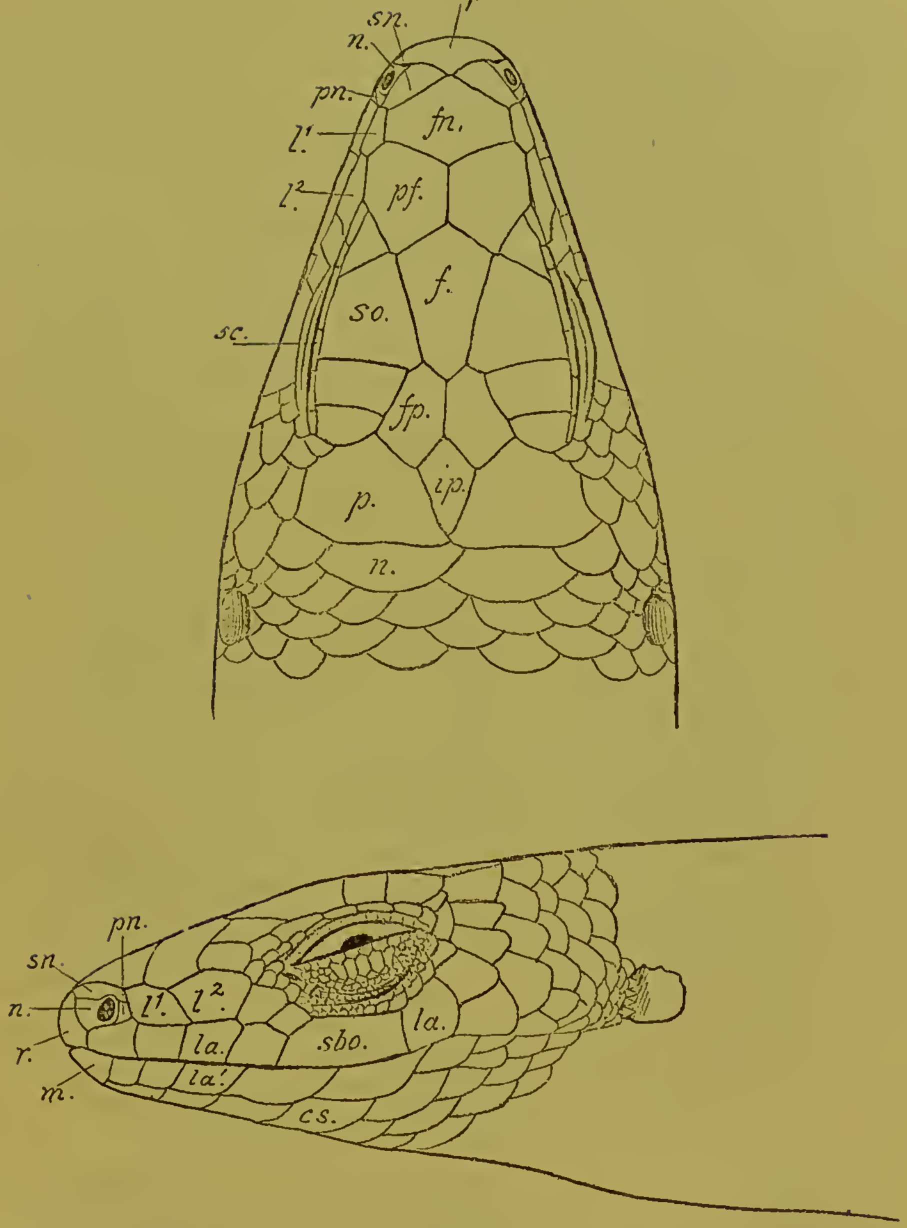

Fig. 54.—Upper and side view of head of *Mabuia multifasciata*, to explain the nomenclature of the shields.

cs. Chin-shields.
f. Frontal.
fn. Frontonasal.
fp. Frontoparietal.
ip. Interparietal.
l. Loreals.
la. Upper labials.
la'. Lower labials.
m. Mental.
n. Nasal.
n'. Nuchal.
p. Parietal.
pf. Præfrontal.
pn. Postnasal.
r. Rostral.
sbo. Subocular.
sc. Supraciliaries.
sn. Supranasal.
so. Supraocular.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Palatine bones in contact on median line of palate (fig. 55, *b* & *c*).
  a. Tympanum, if distinct, more or less sunk.
    a'. Eyelids movable; claws not retractile; pterygoid bones separated on median line of palate, palatal notch extending anteriorly to an imaginary line connecting centres of eyes (fig. *b*) — MABUIA, p. 183.
    b'. Eyelids movable; claws not retractile; palatal notch not extending to between centres of eyes (fig. *c*) .... LYGOSOMA, p. 192.
    c'. Eyelids immovable, transparent, covering eye .... ABLEPHARUS, p. 213.
    d'. Eyelids movable; claws retractile into a sheath........................ RISTELLA, p. 214.
  b. Tympanum exposed and superficial .... TROPIDOPHORUS, p. 217.
B. Palatine bones separated on median line (fig. *a*).
  a. Nostril pierced in nasal, or between nasal and supranasal.
    a'. Limbs pentadactyle, not denticulated. EUMECES, p. 218.
    b'. Limbs pentadactyle, denticulated laterally .... SCINCUS, p. 220.
    c'. Limbs rudimentary .... OPHIOMORUS, p. 221.
  b. Nostril pierced between rostral and a very small nasal, or between rostral and first labial.
    a'. Nostril pierced between rostral and a very small nasal, in an emargination of the former shield; limbs developed.......................... CHALCIDES, p. 223.
    b'. Nostril pierced between rostral, nasal, and first labial; no limbs .... SEPOPHIS, p. 225.
  c. Nostril pierced in rostral.
    a'. Nostril close to posterior border of rostral .... CHALCIDOSEPS, p. 226.
    b'. Nostril pierced in the very large rostral, with posterior border of which it is connected by a horizontal suture. ACONTIAS, p. 226.

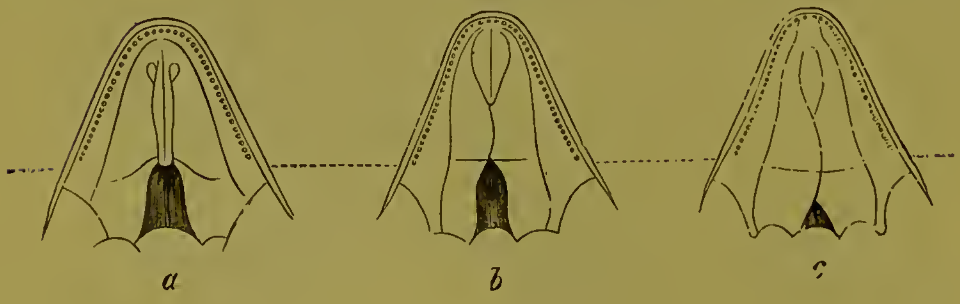

Fig. 55.

Genus MABUIA,

Fitzinger, N. Classif. Rept. p. 23, 1826.

Palatine bones in contact mesially; palatal notch separating entirely the pterygoids, extending forward to between the centres of the eyes (see fig. *b*, p. 182); pterygoid teeth minute or absent. Maxillary teeth conical or bicuspid. Eyelids movable. Ear distinct; tympanum more or less deeply sunk. Nostril pierced in a single nasal; supranasals, præfrontals, and frontoparietal present; single or double interparietal usually distinct, sometimes coalesced with the parietals. Limbs well developed, pentadactyle. Digits subcylindrical or compressed, with transverse lamellæ beneath.

Distribution. Africa and Madagascar; Southern Asia; Central and South America and West Indies. 66 species are known.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Lower eyelid with an undivided, more or less transparent disk.	
a. 28 to 30 scales round middle of body; dorsals with 5 to 7 sharp keels....	*M. bibronii*, p. 184.
b. 34 scales round body; dorsals with 7 or 9 sharp keels, 2 of which are stronger than the others..........	*M. doriæ*, p. 184.
c. 34 to 36 scales round body, dorsals strongly bicarinate..............	*M. dissimilis*, p. 185.
d. 34 to 38 scales round body, dorsals feebly tricarinate or almost smooth.	*M. septemtæniata*, 185.
e. 32 to 34 scales round body, dorsals quinquecarinate	*M. innotata*, p. 186.
B. Lower eyelid scaly, or the transparent disk divided into two or more parts.	
a. Dorsal scales with 9 keels	*M. novemcarinata*, p. 187.
b. Dorsal scales with 3, 5, or 7 keels.	
a'. No postnasal.	
a''. Subdigital lamellæ keeled	*M. beddomii*, p. 187.
b''. Subdigital lamellæ smooth.	
α. 34 to 36 scales round body, dorsals with 3 or 5 keels; supranasals in contact behind rostral; three light, black-edged dorsal bands	*M. vertebralis*, p. 188.
β. 30 to 34 scales round body, dorsals with 3 or 5 keels; supranasals rarely in contact; six supraciliaries; a light dorso-lateral band	*M. carinata*, p. 188.
γ. 26 to 30 scales round body, dorsals with 5 or 7 keels; five supraciliaries; anterior loreal deeper than second ..	*M. macularia*, p. 189.
δ. 26 scales round body, dorsals and laterals very strongly 5-keeled; anterior loreal not deeper than second	*M. rugifera*, p. 190.

b'. A postnasal, separated from the nasal by a suture just behind nostril; dorsal scales tricarinate.
  a''. 30 to 34 scales round body .... *M. multifasciata*, p. 191.
  b''. 26 scales round body .... *M. tytleri*, p. 191.
c. Dorsal scales 4-keeled.............. *M. quadricarinata*, p. 192.

203. Mabuia bibronii.

Tiliqua bibronii, *Gray, Ann. N. H.* ii, 1838, p. 290.
Euprepis trilineatus, *Gray, A. M. N. H.* xviii, 1846, p. 430; *Günth. Rept. B. I.* p. 81; *Theob. Cat.* p. 52.
Mabuia bibronii, *Bouleng. Cat. Liz.* iii, p. 173.

Snout short, obtusely pointed. Lower eyelid with an undivided transparent disk. Nostril behind the vertical of the suture between the rostral and the first labial; a postnasal; anterior loreal not or but slightly in contact with the first labial; frontonasal a little broader than long, usually in contact with the rostral and the frontal; the latter longer than the frontoparietals and interparietal together, in contact with the second supraocular only; 4 supraoculars, second very large; normally 5 supraciliaries; frontoparietals distinct, usually longer than the interparietal; parietals very short, entirely separated, transversely bisected; two pairs of nuchals; subocular between the fourth and fifth upper labials, twice as long as these shields, not narrowed inferiorly. Ear-opening small, oval, with two long pointed lobules, upper largest. Dorsal, nuchal, and lateral scales with from 5 to 7 sharp keels; 28 to 30 scales round the middle of the body, dorsals largest. The hind limb reaches the wrist or the elbow of the adpressed fore limb. Subdigital lamellæ smooth. Tail $1\frac{1}{4}$ or $1\frac{1}{3}$ times length of head and body. Olive above; a yellowish vertebral band, broadly edged with black, beginning on the vertex, sometimes indistinct on the hinder part of the body, which may be spotted with yellowish; a black dorso-lateral band, beginning from the eye, edged below by a whitish narrower band, which is again edged with black; sometimes a second light band, extending from axilla to groin. Lower surfaces whitish.

From snout to vent 1·75 inches; tail 2·25.

Hab. Carnatic.

204. Mabuia doriæ.

Mabuia doriæ, *Bouleng. Cat. Liz.* iii, p. 174, pl. x, fig. 4.

Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril behind the vertical of the suture between the rostral and the first labial; a postnasal; anterior loreal just touching the first labial; supranasals in contact behind the rostral; frontonasal broader than long, in contact with the frontal; the latter longer than the frontoparietals and interparietal together, in contact with the second supraocular only; 4 supraoculars, second largest; 7 supraciliaries; frontoparietals distinct, about as large as the interparietal, which entirely separates the parietals; a pair of nuchals; subocular between the fourth and fifth upper labials, not

twice as long as these shields, not narrowed below. Ear-opening a little smaller than eye-opening, with 2 or 3 long pointed lobules, upper largest. Dorsal, nuchal, and lateral scales with 7 or 9 sharp keels, two of which are stronger than the others; 34 scales round the middle of the body, dorsals largest. The hind limb reaches the wrist of the adpressed fore limb. Subdigital lamellæ smooth. Pale olive above, with 4 longitudinal series of small blackish spots on the body; a broad blackish-brown lateral band beginning from the nostril and passing through the eye; lower surfaces whitish.

From snout to vent 2·5 inches.

Hab. Menhla, Upper Burma.

205. Mabuia dissimilis.

Tiliqua trivittata, *Gray, Zool. Journ.* iii, 1827, p. 227; *id. Ill. Ind. Zool.* ii, pl. lxxvi.
Euprepis dissimilis, *Hallow. Trans. Amer. Phil. Soc.* (2) xi, 1857, p. 78.
Euprepes monticola, *Günth. Rept. B. I.* p. 80, pl. x, fig. C; *Theob. Cat.* p. 52.
Euprepes petersi, *Steindachn. Novara, Rept.* p. 43; *Theob. l. c.* p. 53.
Euprepes guentheri, *Blanf. J. A. S. B.* xlviii, 1879, p. 123.
Mabuia dissimilis, *Bouleng. Cat. Liz.* iii, p. 175.

Snout moderate, obtuse. Lower eyelid with an undivided semi-transparent disk. Nostril behind the vertical of the suture between the rostral and the first labial; no postnasal; anterior loreal in contact with the first labial; supranasals in contact behind the rostral; frontonasal broader than long; præfrontals forming a median suture; frontal in contact with the second supraocular only (exceptionally with the first as well); 4 supraoculars, second largest; 6 supraciliaries; frontoparietals distinct, usually nearly as long as the frontal, and larger than the interparietal, which entirely separates the parietals; usually no distinct nuchals; 4, seldom 5, labials anterior to the subocular, which is about twice as long as the neighbouring shields and not narrowed below. Ear-opening oval, larger than a lateral scale, smaller than the eye-opening, with 3 or 4 short pointed lobules anteriorly. Dorsal scales strongly bicarinate, nuchals and laterals tricarinate; 34 to 36 scales round the middle of the body, subequal. The adpressed limbs overlap. Toes short; subdigital lamellæ smooth. Tail about $1\frac{2}{3}$ times length of head and body. Olive or brownish above, black-spotted, and with 3 more or less distinct light longitudinal streaks, the vertebral sometimes absent; flanks white-spotted; a short horizontal white streak below the eye; lower surfaces whitish.

From snout to vent $3\frac{1}{2}$ inches; tail $5\frac{1}{2}$.

Hab. Plains of Northern India, from Sind to Bengal, also in the Western Himalayas (Chamba).

206. Mabuia septemtæniata.

Euprepis septemtæniatus, *Reuss, Mus. Senckenb.* i, p. 47, pl. iii, fig. 1; *Blanf. Zool. E. Persia,* p. 388; *Murray, Zool. Sind,* p. 352.
Mabuia septemtæniata, *Bouleng. Cat. Liz.* iii, p. 177.

Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril entirely or mainly behind the vertical of the suture between the rostral and the first labial; normally no postnasal; anterior loreal in contact with the first labial; supranasals in contact behind the rostral; frontonasals broader than long, in contact with the truncated anterior angle of the frontal; the latter shield as long as the frontoparietals and interparietal together, or a little longer, in contact with the second, or first and second, or second and third supraoculars; 4 supraoculars, second largest and but rarely touching the præfrontal; 5 (rarely 4 or 6) supraciliaries; frontoparietals 2, smaller than the interparietal, which entirely separates the parietals; 1 (or 2) pair of nuchals; 4 labials anterior to the subocular; latter not narrower beneath, about twice as large as the neighbouring labials. Ear-opening oval-subtriangular, about as large as a lateral scale, with 2 or 3 minute projecting lobules anteriorly. Dorsal scales more or less distinctly tricarinate, sometimes almost smooth; the scales on the neck and flanks smooth or very feebly keeled; 34 to 38 scales round the middle of the body; dorsals a little larger than laterals and ventrals. The adpressed limbs overlap. Subdigital lamellæ smooth or obtusely unicarinate. Tail about $1\frac{1}{2}$ times as long as head and body. Two bands, lighter than the ground-colour, which is brownish or greyish, extend along each side, the upper from the supraciliary border, the lower from below the eye; the interspace between these bands dark brown with small whitish spots, or irregularly spotted with darker brown; a narrow vertebral zone constantly remains unspotted; lower surface uniform whitish.

From snout to vent $3\frac{1}{2}$ inches; tail 5.

Hab. Abyssinia, Arabia, Syria, Asia Minor, Persia, Sind according to Murray.

207. Mabuia innotata.

Euprepes innotatus, *Blanford, J. A. S. B.* xxxix, 1870, p. 354, pl. xvi, fig. 9; *Theob. Cat.* p. 52.
Mabuia innotata, *Bouleng. Cat. Liz.* iii, p. 178.

Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced behind the vertical of the suture between the rostral and the first labial; no postnasal; anterior loreal in contact with the first labial; frontonasal broader than long, in contact with the rostral and (not constantly) with the frontal; latter a little shorter than the frontoparietals and interparietal together, in contact with the second supraocular only; 4 supraoculars, second very large; 6 supraciliaries; frontoparietals distinct, slightly shorter than the interparietal, which entirely separates the parietals; a pair of nuchals; 4 labials anterior to the subocular, which is at least twice as long as the neighbouring labials, and not narrower below. Ear-opening triangular, a little larger than a lateral scale, with three or four short lobules anteriorly. Nuchal and lateral scales mostly feebly tricarinate; dorsals quinquecarinate; 34 (or 32) scales round the middle of the body. The hind limb reaches the wrist of the adpressed fore limb. Subdigital lamellæ smooth.

Tail about $1\frac{3}{4}$ times length of head and body. Bronzy olive above, sides dark brown; a light, black-edged streak on each side, from the præfrontal and along the supraciliaries to the anterior third of the back, where it gradually disappears; a light streak from below the eye to the shoulder; lower surfaces whitish.

From snout to vent 2·2 inches; tail 3·75.

Hab. Penganga Valley, S.E. Berár.

208. Mabuia novemcarinata.

Euprepes novemcarinatus, *Anders. J. A. S. B.* xl, 1871, p. 12; *Theob. Cat.* p. 51.
Mabuia novemcarinata, *Bouleng. Cat. Liz.* iii, p. 179.

"Supranasals forming a suture behind the rostral. Eyelid scaly. Præfrontals and vertical (frontal) meet in a point. Seven upper labials, the fifth the longest. Ear obliquely oval, with two or three strong prominent denticulations; 32 longitudinal lines of scales round the body and 42 transverse lines between the axils. Scales with 9 keels, the 3 central ones strongly marked. The fore limb reaches to the anterior angle of the eye; hind limb as long as two thirds of the distance between the axils. Above olive-brown, with 4 or 5 narrow longitudinal black lines along the back. A deep brown band from the nostril through the eye and above the ear, along the side and on to the base of the tail, with a moderately [?] white band above far over the supercilium along the side of the back; another through the upper labials and ear to the shoulder, where it changes into the pale greenish yellow of the side. A very faint broken blackish line from the angle of the mouth to the shoulder, and three or four from behind the fore limb along the side of the belly. Limbs with 5 longitudinal black lines with scattered white spots."

From snout to vent 3·8 inches; tail 4·3.

Hab. Mandalay, Burma.

209. Mabuia beddomii.

Euprepes beddomii, *Jerdon, P. A. S. B.* 1870, p. 73; *Theob. Cat.* p. 52.
Euprepes (Tiliqua) septemlineatus, *Blanford, J. A. S. B.* xxxix, 1870, p. 360, pl. xvi, figs. 7, 8; *Theob. l. c.* p. 50.
Mabuia beddomii, *Bouleng. Cat. Liz.* iii, p. 179.

Snout short, obtuse. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; no postnasal; anterior loreal deeper and shorter than the second, in contact with the first labial; supranasals in contact behind the rostral; frontonasal broader than long, sometimes in contact with the frontal; the latter usually as long as, or a little shorter than, the frontoparietals and interparietal together, sometimes not longer than the frontoparietals, in contact with the second, or rarely first and second, supraoculars; 4 supraoculars, second largest; 6 supraciliaries, first longest; frontoparietals distinct, as long as or longer than the interparietal, which usually entirely separates the parietals; a pair

of nuchals; 4 labials anterior to the subocular, which is large and not narrower below. Ear-opening oval, as large as a lateral scale, or a little smaller, with three short pointed lobules anteriorly. Dorsal and nuchal scales with 3 or 5 keels, sometimes very feeble; 30 to 32 scales round the middle of the body, subequal. The adpressed limbs meet or slightly overlap. Subdigital lamellæ unicarinate. Scales on upper surface of tibia mostly tricarinate. Tail $1\frac{2}{3}$ to $2\frac{1}{5}$ times the length of head and body. The coloration varies considerably, but a lateral black band, edged above and below with a whitish streak, is constant. Some (young) specimens black above, with seven light longitudinal lines; others olive-brown with four black dorsal streaks, which may not extend further back than the nape; or a light black-edged vertebral band may be present; head-shields spotted or variegated with black; limbs and tail rufous; lower surfaces white.

From snout to vent 2·2 inches; tail 4·75.

Hab. Southern India, Salem, Tinnevelly, Malabar, Mysore, &c., the most northern locality known being S.E. Berar.

210. Mabuia vertebralis.

Tiliqua trivittata (*non Gray*), *Jerdon, J. A. S. B.* xxii, 1853, p. 478.
Euprepes trivittatus, *Theob. Cat.* p. 50.
Mabuia vertebralis, *Bouleng. Cat. Liz.* iii, p. 180.

Snout short, obtuse. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; no postnasal; anterior loreal in contact with the first labial, much deeper and shorter than the second; supranasals in contact behind the rostral; frontonasal broader than long; præfrontals forming a short median suture; frontal as long as the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, second largest; 6 supraciliaries, first largest; frontoparietals distinct, longer than the interparietal, which entirely separates the parietals; a pair of nuchals; 4 labials anterior to the subocular, which is twice as large as the neighbouring labials, and not narrowed below. Ear-opening oval, nearly horizontal, with 2 or 3 scarcely projecting lobules. Nuchal and dorsal scales with 3 or 5 keels; 34 or 36 scales round the body, subequal. The adpressed hind limb reaches the wrist of the adpressed fore limb. Subdigital lamellæ smooth. Scales on upper surface of tibia mostly bicarinate. Tail $1\frac{1}{4}$ times length of head and body. Olive-brown above, with three pale black-edged longitudinal bands; a light lateral streak from the ear to the tail; lower surfaces whitish.

From snout to vent 2·5 inches; tail 3·5.

Hab. Deccan (Poona, Jálna, Belgaum, and perhaps Nágpur).

211. Mabuia carinata.

Scincus carinatus, part., *Schneid. Hist. Amph.* ii, p. 183.
Euprepes rufescens, part., *Günth. Rept. B. I.* p. 79, pl. x, fig. B.
Euprepes carinatus, *Theob. Cat.* p. 49; *Murr. Zool. Sind,* p. 351.
Mabuia carinata, *Bouleng. Cat. Liz.* iii, p. 181.

Snout moderate, obtuse. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; no postnasal; anterior loreal usually shorter and deeper than the second, in contact with the first labial; frontonasal broader than long, usually in

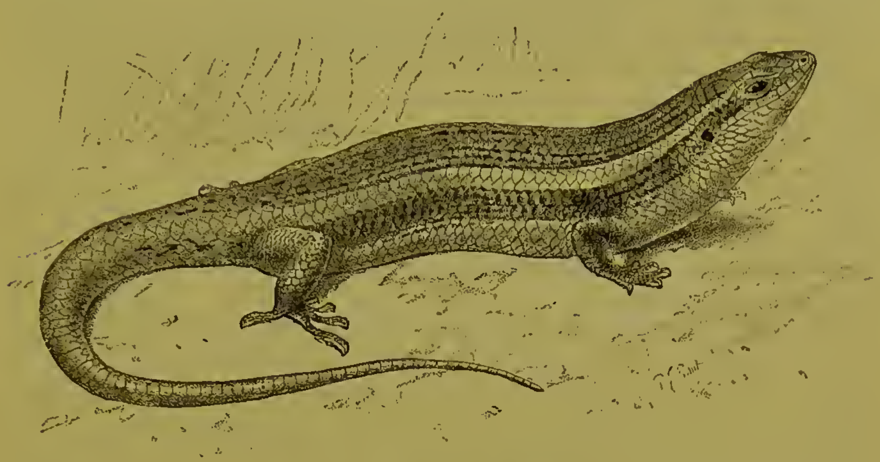

Fig. 56.—*Mabuia carinata.*

contact with the rostral, and frequently also with the frontal; latter as long as the frontoparietals and interparietal together or shorter, in contact with the second supraocular (rarely also with the first); 4 supraoculars, second largest; usually 6 supraciliaries, first largest; frontoparietals distinct, larger than the interparietal, which entirely separates the parietals; a pair of nuchals; 4 labials anterior to the subocular, which is large and not narrower below. Ear-opening roundish, subtriangular, as large as a lateral scale or smaller, without or with a few very indistinct lobules anteriorly. Dorsal, nuchal, and lateral scales more or less strongly tri- or quinquecarinate; 30 to 34 scales round the middle of the body, subequal. The hind limb reaches the wrist or the elbow of the adpressed fore limb. Subdigital lamellæ smooth. Scales on upper surface of tibia mostly bicarinate. Tail $1\frac{1}{3}$ to $1\frac{4}{5}$ times length of head and body. Brown or olive-brown above, uniform or with small black spots or longitudinal lines; sides darker, with or without lighter spots; a light dorso-lateral band begins on the supraciliaries; lower surfaces yellowish (in spirit). In the breeding-season males have a scarlet band from the shoulder to the thigh.

From snout to vent 5 inches; tail 9·5.

Hab. India, Ceylon, Burma; very common.

212. Mabuia macularia.

Euprepes macularius, *Blyth, J. A. S. B.* xxii, 1853, p. 652; *Theob. Cat.* p. 49; *Murr. Zool. Sind*, p. 351.

Tiliqua multicarinata (*non Gray*), *Jerdon, J. A. S. B.* xxii, 1853, p. 479, footnote.

Euprepes rufescens, part., *Günth. Rept. B. I.* p. 79.

Euprepes brevis, *Günth. P. Z. S.* 1875, p. 225.
Euprepes subunicolor, *Blanf. J. A. S. B.* xlviii. 1879, p. 112.
Mabuia macularia, *Bouleng. Cat. Liz.* iii, p. 182.
Mabuia brevis, *Bouleng. l. c.* p. 183, pl. xi, fig. 1.

Snout short, obtusely keeled, acuminate. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; no postnasal; anterior loreal deeper and shorter than second; frontonasal as long as broad or a little broader than long, in contact with the rostral and usually also with the frontal; latter as long as the frontoparietals and interparietal together or a little longer, in contact with the second, or first and second, supraoculars; 4 supraoculars, second largest; 5 supraciliaries, third longest; frontoparietals distinct, larger than the interparietal, which entirely separates the parietals; a pair of nuchals; 4, exceptionally 3, labials anterior to the subocular, which is large and not narrowed below. Ear-opening oval, as large as a lateral scale, or a little smaller, with or without a few very indistinct lobules anteriorly. Dorsal, nuchal, and lateral scales with 5 to 7 sharp keels; 26 to 30 scales round the middle of the body, subequal. The adpressed limbs meet or overlap. Digits short; subdigital lamellæ smooth. Scales on upper surface of tibia mostly bicarinate. Tail $1\frac{1}{4}$ to $1\frac{3}{4}$ times the length of head and body. Brown or olive-brown above, sides darker and usually with white black-edged spots; back uniform, or black-spotted, or with one or two black longitudinal lines; sometimes two light lateral lines on each side, well marked only on the neck; lower surfaces yellowish (in spirit).

From snout to vent 2·5 inches; tail 3·5.

Hab. Ceylon, Peninsular India, Cutch, Sind, Bengal, Burma, Indo-China.

This species is stated by Theobald to be oviparous, whilst its close ally *M. carinata* is, like most Scincoids, viviparous.

213. Mabuia rugifera.

Tiliqua rugifera, *Stoliczka, J. A. S. B.* xxxix, 1870, p. 170, pl. x, fig. 3; *Theob. Cat.* p. viii.
Mabuia rugifera, *Bouleng. Cat. Liz.* iii, p. 184.

Snout short, obtuse. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; no postnasal; anterior loreal not deeper but much smaller than second; frontonasal broader than long, largely in contact with the rostral and with the frontal; the latter shield longer than the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, second largest; 6 supraciliaries, first largest; frontoparietals distinct, larger than the interparietal; a pair of nuchals; 5 (or 4) labials anterior to the subocular, which is large and not narrower below. Ear-opening very small, oval, horizontal, with projecting granules round its border. Dorsal, nuchal, and lateral scales very strongly quinquecarinate; 26 scales

round the body, of which 8 or 10 are smooth. The hind limb reaches the elbow of the adpressed fore limb. Subdigital lamellæ smooth. Scales on upper surface of tibia bicarinate. Tail $1\frac{2}{3}$ the length of head and body. Dark olive-brown above, greenish-white inferiorly.

From snout to vent 2·5 inches; tail 4·5.

Hab. Nicobars, Sumatra, Java, Borneo.

214. Mabuia multifasciata.

Scincus carinatus, part., *Schneid. Hist. Amph.* ii, p. 183.
Scincus multifasciatus, *Kuhl, Beitr. z. Zool. u. vergl. Anat.* p. 126.
Tiliqua rubriventris, *Gray, Ill. Ind. Zool.* ii, pl. lxxv, fig. 1.
Euprepes rufescens, *Cantor, J. A. S. B.* xvi, 1847, p. 652; *Günth. Rept. B. I.* p. 79 (part.).
Plestrodon sikkimensis, *Gray, A. M. N. H.* (2) xii, 1853, p. 388.
Euprepes carinatus, part., *Theob. Cat.* p. 49.
Mabuia multifasciata, *Bouleng. Cat. Liz.* iii, p. 186.

Snout moderate, obtuse. Lower eyelid scaly. Nostril behind vertical of the suture between rostral and first labial; a postnasal; anterior loreal not deeper than the second, in contact with the first labial; supranasals frequently in contact behind rostral; frontonasal broader than long; præfrontals constantly forming a median suture; frontal as long as or shorter than the frontoparietals and interparietal together, in contact with the second (rarely also with the first) supraocular; 4 supraoculars, second largest; 6 supraciliaries, first largest; frontoparietals distinct, larger than the interparietal, which entirely separates the parietals; a pair of nuchals; 4 labials anterior to the subocular, which is large and not narrower below. Ear-opening roundish or oval, as large as a lateral scale, or a little smaller, with or without a few very small lobules anteriorly. Dorsal scales more or less distinctly tri- (rarely quinque-) carinate; nuchals and laterals usually very feebly keeled, sometimes smooth; 30 to 34 scales round the middle of the body, subequal or dorsals largest. The hind limb reaches the wrist or the elbow of the adpressed fore limb. Subdigital lamellæ smooth. Scales on upper surface of tibia mostly tricarinate. Tail $1\frac{1}{3}$ to $1\frac{2}{3}$ times length of head and body. Brown or olive above; some specimens uniform, or with a large whitish (red) patch on each side; back frequently with small black spots, sometimes confluent into longitudinal lines; sides frequently dark brown, with whitish, black-edged ocelli; a well-defined light dorso-lateral band seldom present; lower surfaces yellowish or greenish white.

From snout to vent 5 inches; tail 8.

Hab. Sikhim (?), Burma, Siam, Malay Peninsula and Archipelago.

215. Mabuia tytleri.

Tiliqua rufescens, part., *Theobald, Cat. Rept. As. Soc. Mus.* p. 23.
Tiliqua carinata, part., *Stoliczka, J. A. S. B.* xxxix, 1870, p. 169.
Mabuia tytleri, *Bouleng. Cat. Liz.* iii, p. 187.

From what can be gathered from the short remarks of Theobald and Stoliczka, the Andamans *Mabuia* is surely distinct from the other species of the genus. It is said to have only 26 scales round the body, the dorsals feebly tricarinate, the middle keel being weaker than the lateral ones. The supranasals are in contact behind the rostral. Above uniform, somewhat pale brown, paler on the sides towards the belly, and with a few indistinct darker spots; limbs spotted with white and dark brown; below yellowish white; tail leaden grey.

From snout to vent about 8 inches; tail about 12.

Hab. Andaman Islands.

216. Mabuia quadricarinata.

Mabuia quadricarinata, *Bouleng. Ann. Mus. Genova,* (2) iv, 1887, p. 618.

Snout moderate, obtuse. Lower eyelid scaly. Nostril behind vertical of suture between rostral and first labial; a postnasal; anterior loreal not or but very slightly deeper than the second, in contact with the second labial only; rostral forming a suture with the frontonasal; præfrontals forming a median suture; frontal as long as frontoparietals and interparietal together or a little shorter, in contact with the second supraocular; 4 supraoculars, second largest; 6 supraciliaries, second and third longest; frontoparietals distinct, as large as or a little larger than the interparietal, behind which the parietals form a median suture; a pair of nuchals; 3 or 4 labials anterior to the subocular, which is large and not narrowed below. Ear-opening roundish, a little smaller than a lateral scale, without distinct lobules. Dorsal scales strongly quadricarinate, nuchals mostly tri- or quinquecarinate; 26 to 28 scales round the middle of the body, subequal. The hind limb reaches the wrist or the elbow of the adpressed fore limb. Subdigital lamellæ smooth. Scales on upper surface of hind limb bicarinate. Tail nearly twice as long as head and body. Olive above, with small black spots; a whitish streak, edged with black above, from below the eye to the ear; lower surfaces whitish.

From snout to vent 2 inches; tail 3·5.

Hab. Kakhyen Hills.

Genus LYGOSOMA,

Gray, Zool. Journ. iii, 1827, p. 228.

Palatine bones in contact mesially; pterygoid bones also in contact anteriorly, the palatal notch not extending forwards to between the centres of the eyes (see fig. *c*, p. 182); pterygoid teeth minute or absent. Maxillary teeth conical or obtuse. Eyelids well developed. Ear distinct (or hidden); if distinct, tympanum more or less sunk. Nostril pierced in the nasal; supranasal present or absent. Limbs more or less developed (or absent).

Of all Reptilian genera this contains the most species, the number amounting already to 166. They are represented in every part of the World, Europe excepted, attaining their greatest number and variety of form in the Australian Region.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Limbs well developed, pentadactyle; length of hind limb exceeds distance between centre of eye and fore limb; lower eyelid scaly.
- *a.* No supranasals; dorsal scales smooth.
  - *a'*. Four large supraoculars; rostral convex.
    - *a''*. 36 to 38 scales round middle of body .... *L. indicum*, p. 195.
    - *b''*. 30 to 32 scales round body ...... *L. zebratum*, p. 195.
  - *b'*. Five large supraoculars; rostral flat or concave above; 38 to 40 scales round middle of body.
    - *a''*. The hind limb, stretched forwards, does not reach beyond axilla.... *L. maculatum*, p. 196.
    - *b''*. The hind limb reaches shoulder or beyond .... *L. dussumieri*, p. 197.
- *b.* Supranasals present; dorsal scales keeled; 28 to 30 scales round body.. *L. olivaceum*, p. 197.

B. Limbs well developed, pentadactyle; length of hind limb exceeds distance between centre of eye and fore limb; lower eyelid with an undivided transparent disk; no supranasals.
- *a.* Rostral forming a straight suture with frontonasal.
  - *a'*. Frontoparietals two.
    - *a''*. No enlarged nuchals.
      - *α*. 30 scales round middle of body; frontonasal in contact with frontal .... *L. kakhienense*, p. 198.
      - *β*. 34 to 36 scales round body; præfrontals forming a median suture .... *L. melanostictum*, p. 199.
    - *b''*. Two to five pairs of enlarged nuchals.
      - *α*. Ear-opening smaller than transparent palpebral disk; 22 to 24 scales round middle of body .... *L. sikkimense*, p. 199.
      - *β*. 26 or more scales round body.
        - *α'*. 26 to 30 scales round body; 16 to 18 lamellæ under fourth toe; ear-opening about as large as transparent palpebral disk .... *L. himalayanum*, p. 200.
        - *β'*. 26 to 28 scales round body; 16 to 18 lamellæ under fourth toe ear-opening considerably larger than transparent palpebral disk .... *L. doriæ*, p. 201.

γ'. 32 to 38 scales round body . . *L. ladacense*, p. 201.
δ'. 26 to 28 scales round body; 21 to 25 lamellæ under fourth toe. . . . . *L. laterimaculatum*, p. 202.
γ. 20 to 24 scales round body; ear-opening larger than transparent palpebral disk.
α'. Enlarged præanals much longer than broad . . . . *L. bilineatum*, p. 202.
β'. Enlarged præanals not much longer than broad . . . . *L. beddomii*, p. 203.
b'. Frontoparietal single; 22 to 24 scales round body.
a''. Ear-opening much smaller than eye-opening . . . . *L. travancoricum*, p. 204.
b''. Ear-opening very large . . . . *L. macrotympanum*, p. 204.
b. Posterior border of rostral convex and forming a curved suture with fronto-nasal . . . . *L. macrotis*, p. 205.
C. Limbs weak.
a. Lower eyelid scaly; no supranasals; 24 or 26 scales round body.
a'. Frontoparietals two . . . . *L. taprobanense*, p. 206.
b'. Frontoparietal single. . . . . *L. fallax*, p. 206.
b. Lower eyelid scaly; supranasals present.
a'. Frontoparietal single; 24 or 26 scales round body . . . . *L. lineolatum*, p. 207.
b'. Frontoparietals two; 26 or 28 scales round body.
a''. Ear-opening hardly as large as pupil; hind limb half as long as distance between axilla and groin. *L. comotti*, p. 207.
b''. Ear-opening oval, larger than pupil; hind limb measuring less than half distance between axilla and groin . . . . *L. albopunctatum*, p. 208.
c. Lower eyelid with an undivided transparent disk; supranasals present.
a'. 24 or 26 scales round body; frontoparietals two.
a''. Distance between end of snout and fore limb contained 2–2½ times in distance between axilla and groin . . . . *L. punctatum*, p. 208.
b''. Distance between end of snout and fore limb contained about 3 times in distance between axilla and groin . . . . *L. guentheri*, p. 209.
b'. 22 scales round body.
a''. Frontoparietals two.
a. The fore limb reaches a little beyond the ear; 4th toe a little longer than 3rd.
α'. Distance between end of snout and fore limb contained twice in distance between axilla and groin . . . . *L. feæ*, p. 210.

β′. Distance between end of snout and fore limb contained at least twice and a half in distance between axilla and groin .... *L. cyanellum*, p. 210.
β. Fore limb does not reach ear; 3rd and 4th toes equal ...... *L. anguinum*, p. 211.
b″. Frontoparietal single.
α. Hind limb with 5 toes .... *L. calamus*, p. 211.
β. Hind limb with 4 toes .... *L. lineatum*, p. 212.

217. Lygosoma indicum.

Hinulia indica, *Gray, A. M. N. H.* (2) xii, 1853, p. 388; *Theob. Cat.* p. 54.
Eumeces indicus, part., *Günth. Rept. B. I.* p. 89.
Lygosoma indicum, *Bouleng. Cat. Liz.* iii, p. 241, pl. xvi. fig. 1.

Habit lacertiform; the distance between the end of the snout and the fore limb contained $1\frac{2}{5}$ to $1\frac{3}{5}$ times in the distance between axilla and groin. Snout short, obtuse; loreal region nearly vertical. Lower eyelid scaly. Nostril pierced in a single nasal, or between a nasal and a postnasal; no supranasal; rostral convex, largely in contact with the frontonasal, which is broader than long, and forms a narrow suture with the frontal; the latter as long as frontoparietal and parietals together, in contact with the first, second, and third supraoculars; 4 large supraoculars, followed by 2 very small ones; first supraocular not much longer than second; 9 or 10 supraciliaries, first largest; frontoparietals and interparietal distinct, former a little longer than latter; parietals forming a short suture behind the interparietal; no nuchals; fifth and sixth upper labials largest and below the eye. Ear-opening oval, smaller than eye-opening; no auricular lobules. 36 or 38 smooth scales round the middle of the body, laterals smallest. A pair of large præanals. When the limbs are pressed against the body, the hind limb reaches the elbow or not quite so far. Digits rather elongate, compressed; subdigital lamellæ smooth or obtusely keeled, 17 to 20 under the fourth toe. Tail almost twice as long as head and body. Brown or olive above, uniform or with scattered darker dots; sides of head and body dark brown, light-margined above; usually with large light spots; lower surface whitish.

From snout to vent 3·5 inches; tail 6.

Hab. Eastern Himalayas (common at Darjeeling), hills of Assam and Burma.

218. Lygosoma zebratum.

Lygosoma zebratum, *Bouleng. Ann. Mus. Genova*, (2) v. 1887, p. 478, pl. vii. fig. 1.

Habit lacertiform; the distance between the end of the snout and the fore limb contained $1\frac{1}{2}$ to $1\frac{3}{5}$ times in the distance between axilla and groin in the adult, scarcely more than once in the young. Snout short, obtuse; loreal region nearly vertical. Lower

eyelid scaly. Nostril pieced between a nasal and a postnasal; no supranasal; rostral convex, forming a suture with the frontonasal, which is broader than long and forms a narrow suture with the frontal; latter shield as long as frontoparietals and parietals together, in contact with the first and second, or first, second, and third supraoculars; four large supraoculars, followed by two very small ones; first supraocular longer than second; 10 or 11 supraciliaries, first largest; frontoparietals and interparietal distinct, subequal, or former a little larger than latter; parietals forming a short suture behind the interparietal; enlarged nuchals absent or one pair only present; fifth and sixth upper labials largest and below the eye. Ear-opening oval, smaller than the eye-opening; no auricular lobules. 30 or 32 smooth scales round the middle of the body, laterals very slightly smaller than dorsals. A pair of large præanals. The adpressed limbs meet, or the hind limb reaches the wrist in the adult; the hind limb reaches the axilla in the young. Digits rather elongate, compressed; subdigital lamellæ smooth or obtusely keeled, 20 to 22 under the fourth toe. Tail $1\frac{1}{2}$ to $1\frac{3}{4}$ times length of head and body. Brown or bronzy above, uniform, with a broad dark brown or black lateral band, below which the lips and sides of the neck and body are ornamented with alternately dark and light vertical bars; these markings most distinct in the young; usually a black line or series of black spots along the upper surface of the tail; lower surface uniform whitish.

From snout to vent 3·5 inches.

Hab. Hills of Northern Tenasserim (Mount Muleyit, Pla-pu, 3300 to 3600 feet).

219. **Lygosoma maculatum.**

Lissonota maculata, *Blyth, J. A. S. B.* xxii, 1853, p. 653.
Mabouia maculata, *Günth. Rept. B. I.* p. 84.
Hinulia maculata, *Theob. Cat.* p. 55.
Eumeces indicus, part., *Günth. l. c.* p. 89.
Lygosoma maculatum, *Bouleng. Cat. Liz.* iii, p. 242.

Habit lacertiform; distance between end of snout and fore limb equals $1\frac{1}{5}$ to $1\frac{1}{2}$ times distance between axilla and groin. Snout short, obtuse; loreal region nearly vertical. Lower eyelid scaly. Nostril pierced in a single nasal; no supranasals; rostral perfectly flat or a little concave above, largely in contact with the frontonasal, which is broader than long, and forms a narrow suture with the frontal; latter as long as frontoparietals and parietals together, in contact with the two or three anterior supraoculars; 5 large supraoculars, first much longer than second, fifth smallest; 9 or 10 supraciliaries, first and last largest; frontoparietals and interparietal distinct, former a little longer than latter; parietals forming a short suture behind the interparietal; no nuchals; fifth and sixth upper labials largest and below the eye. Ear-opening oval, smaller than the eye-opening; no auricular lobules. 38 or 40 smooth scales round the middle of the body; dorsals largest, laterals smallest. A pair of large præanals.

The hind limb reaches the elbow or the axilla. Digits long, compressed; subdigital lamellæ feebly unicarinate, 16 to 21 under the fourth toe. Tail almost twice as long as head and body. Brown or olive-brown above, usually with two dorsal series of small dark brown spots; a dark brown lateral band, usually spotted with whitish and edged below with white, extends from the nostril to the tail, passing through the eye and above the ear; flanks white-spotted; lower surface white.

From snout to vent 2·5 inches; tail 4·5.

Hab. Eastern Himalayas (Sikhim), Northern Bengal, Assam, Burma to Mergui, Andaman Islands.

220. Lygosoma dussumieri.

Lygosoma dussumierii, *Dum. & Bibr. Erp. Gén.* v, p. 725; *Bouleng. Cat. Liz.* iii, p. 243.
Hinulia dussumierii, *Theob. Cat.* p. 55.

Habit lacertiform; distance between end of snout and fore limb contained 1 to $1\frac{1}{3}$ times in distance between axilla and groin. Snout short, obtuse; loreal region concave. Lower eyelid scaly. Nostril pierced in a single nasal; no supranasal; rostral flat or a little concave above, largely in contact with the frontonasal, which is broader than long and sometimes in contact with the frontal; præfrontals sometimes forming a median suture; frontal as long as frontoparietals and parietals together, in contact with the three (or two) anterior supraoculars; 5 large supraoculars, first two sometimes fused into a single shield, first much longer than second; a very small posterior supraocular; 11 to 13 supraciliaries, first and last largest; frontoparietals and interparietal distinct, subequal in length; parietals forming a short suture behind the interparietal; no nuchals; fifth and sixth upper labials largest and below the eye. Ear-opening oval, smaller than the eye-opening; no auricular lobules. 40 smooth scales round the middle of the body, laterals smallest. A pair of large præanals. The hind limb reaches the shoulder or the ear. Digits long, compressed; subdigital lamellæ unicarinate, 22 or 23 under the fourth toe. Tail almost twice as long as head and body. Pale olive above with small light spots or a series of dark brown spots along each side of the back; a broad dark brown lateral band, involving the upper half of the ear, edged above and below with a light streak; tail reddish; lower surface of head and body greenish white.

From snout to vent 2·3 inches; tail 4·3.

Hab. Malabar.

221. Lygosoma olivaceum.

Dasia olivacea, *Gray, Ann. N. H.* ii, 1838, p. 331.
Euprepes ernestii, *Dum. & Bibr. Erp. Gén.* v, p. 696; *Cantor, J. A. S. B.* xvi, 1847, p. 653.

Euprepes olivaceus, *Günth. Rept. B. I.* p. 80, pl. x, fig. D; *Theob. Cat.* p. 51.
Lygosoma olivaceum, *Bouleng. Cat. Liz.* iii, p. 251.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{5}$ to $1\frac{1}{2}$ times in the distance between axilla and groin. Snout rather elongate, obtusely acuminate, much depressed. Lower eyelid scaly. Nostril pierced in the middle of a small nasal; a supranasal, rarely in contact with its fellow; frontonasal broader than long, usually in contact with the rostral, and frequently also with the frontal; latter as long as the frontoparietals and parietals together or a little longer, in contact with the first and second, or first, second, and third supraoculars; 4 supraoculars, subequal in length; 7 or 8 supraciliaries, first largest; frontoparietals and interparietal distinct, latter as large as former or a little smaller, and entirely separating the parietals; a pair of nuchals; 4 labials anterior to the subocular. Ear-opening very small. 28 or 30 scales round the middle of the body, the dorsals and laterals with 3 to 9 more or less strong keels; nuchal scales smooth or indistinctly keeled; dorsals a little larger than ventrals. Præanals not enlarged. The adpressed limbs feebly overlap, the hind limb never reaching beyond the wrist. Digits moderately elongate, with strong sharp claws, the basal phalanges cyclotetragonal, the distal strongly compressed; subdigital lamellæ smooth, 17 to 20 under the fourth toe. Tail about $1\frac{1}{3}$ times the length of the head and body. Young with transverse dark brown bands separated by narrow pale olive interspaces; tail brilliant scarlet. Adult olive or olive-brown above, with more or less regular transverse series of pale, dark-edged spots or traces of dark cross bands; a more or less distinct pale dorso-lateral band on the posterior part of the body, continued on the tail; lower surface light green.

From snout to vent 4·25 inches.

Hab. Tenasserim and Malay Peninsula, Nicobars, Sumatra, Java, Borneo, Philippines.

222. Lygosoma kakhienense.

Lygosoma kakhienense, *Bouleng. Ann. Mus. Genova,* (2) iv, 1887, p. 621.

Habit lacertiform; distance between end of snout and fore limb $1\frac{3}{5}$ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a broad suture with the rostral and in contact with the anterior angle of the frontal; latter shield a little shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, eight supraciliaries: frontoparietals and interparietal distinct, subequal in size: parietals forming a suture behind the interparietal; no enlarged nuchals:

the suture between the fifth and sixth upper labials falls below the centre of the eye. Ear-opening oval, a little smaller than the eye-opening; no auricular lobules. 30 smooth, subequal scales round the middle of the body. No enlarged præanals. The adpressed limbs slightly overlap. Digits subcylindrical; subdigital lamellæ smooth, 16 under the fourth toe. Tail about once and a half the length of head and body. Pale bronzy olive above, with a few black dots; a lateral series of large black spots, partly confluent into a band, from above the ear to the base of the tail, extending forwards, as a narrow streak, to the nostril, and passing through the eye; flanks and lips with black dots.

From snout to vent 1·6 inches; tail 2·4.

Hab. Kakhyen Hills.

223. Lygosoma melanostictum.

Lygosoma melanostictum, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 479, pl. vii, fig. 2.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{3}$ to $1\frac{2}{5}$ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal much broader than long, forming a broad suture with the rostral; præfrontals forming a median suture; frontal as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; 4 supraoculars, first longer than second; 9 or 10 supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietals forming a suture behind the interparietal; no enlarged nuchals; the suture between the fifth and sixth upper labials falls below the centre of the eye. Ear-opening oval, a little smaller than the eye-opening; no auricular lobules. 34 or 36 smooth scales round the middle of the body, laterals smallest. A pair of slightly enlarged præanals. The adpressed limbs hardly meet, or slightly overlap. Digits subcylindrical; subdigital lamellæ smooth, 17 to 19 under the fourth toe. Tail $1\frac{1}{2}$ to $1\frac{3}{4}$ times the length of head and body. Pale brown or bronzy above, with black dots, which are crowded to form a lateral band from the snout to the tail; lips and flanks whitish or pinkish, dotted with black; lower surface whitish, throat often dotted with black.

From snout to vent 2·3 inches.

Hab. Hills of Northern Tenasserim, between 3300 and 4000 feet.

224. Lygosoma sikkimense.

Mocoa sikkimensis, *Blyth, J. A. S. B.* xxii, 1854, p. 652; *Theob. Cat.* p. 56.
Tiliqua schlegelii, *Günth. P. Z. S.* 1860, p. 153, pl. xxv, fig. C.
Eumeces schlegelii, *Günth. Rept. B. I.* p. 86.

Mocoa sacra, *Stoliczka, J. A. S. B.* xli, 1872, p. 128, pl. iv, fig. 4 *Theob. Cat.* p. 57.
Lygosoma sikkimense, *Bouleng. Cat. Liz.* iii, p. 257.

Body more or less elongate; distance between end of snout and fore limb contained $1\frac{1}{3}$ to 2 times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and usually also with the frontal; latter shield as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; 4 supraoculars, second largest; 7 or 8 supraciliaries; frontoparietals and interparietal distinct, subequal; parietals forming a suture behind the interparietal; 2 to 4 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening small, smaller than the palpebral disk, with or without very indistinct lobules. 22 or 24 smooth scales round the middle of the body, dorsals largest. A pair of large præanals. The adpressed limbs fail to meet, meet, or overlap. Digits subcylindrical; subdigital lamellæ smooth, 16 to 19 under the fourth toe. Tail $1\frac{1}{2}$ to $1\frac{3}{4}$ times the length of head and body. Bronzy olive or brown above, dark brown on the sides, which are limited above by a blackish line; back with small blackish spots; sides with small light spots; lower surface whitish.

From snout to vent 1·75 inches; tail 2·75.

Hab. Eastern Himalayas (Sikhim, 3000–10,000 feet): Pareshnáth Hill, Western Bengal.

225. Lygosoma himalayanum.

Eumeces himalayanus, *Günth. Rept. B. I.* p. 86, pl. x, fig. H.
Euprepes blythi, *Steind. Novara, Rept.* p. 46.
Mocoa himalayana *and* M. blythii, *Theob. Cat.* pp. 57, 59.
Lygosoma himalayanum, *Bouleng. Cat. Liz.* iii, p. 257, pl. xvii, fig. 2.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{2}$ to 2 times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield as long as frontoparietals and interparietal together, in contact with the two, rarely three, anterior supraoculars; 4 supraoculars, second largest; 6 to 8 supraciliaries; frontoparietals and interparietal distinct, subequal, or latter smallest; parietals forming a suture behind the interparietal; 3 or 4 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening oval, much smaller than the eye-opening, about as large as the transparent palpebral disk, with one to three projecting lobules or granules anteriorly. 26 to 30 smooth scales round the middle of the body, dorsals largest, laterals smallest. A pair of large præanals. The adpressed limbs fail to meet, meet, or overlap.

Digits subcylindrical; subdigital lamellæ smooth, 16 to 18 under fourth toe. Tail $1\frac{2}{5}$ to $1\frac{2}{3}$ times the length of head and body. Bronzy olive or brown above, with small dark, and sometimes also light spots; a blackish vertebral streak sometimes present; a broad blackish-brown lateral band, usually edged above and below by a light streak; lower surface greenish white or plumbeous.

From snout to vent 2·5 inches; tail 3·5.

Hab. Western Himalayas (Garhwál, Simla), Kashmir (Ladák?).

226. Lygosoma doriæ.

Lygosoma doriæ, *Bouleng. Ann. Mus. Genova*, (2) iv, 1887, p. 620.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{3}$ or $1\frac{1}{4}$ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal twice as broad as long, forming a suture with the rostral, and in contact with the anterior angle of the frontal (in one specimen the præfrontals form a median suture); frontal a little shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; 4 supraoculars; 8 supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietals forming a suture behind the interparietal; 3 or 4 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening oval, smaller than the eye-opening, but considerably larger than the transparent palpebral disk; no auricular lobules. 26 or 28 scales round the middle of the body, smooth, laterals smallest. A pair of enlarged præanals. The hind limb reaches the wrist of the adpressed fore limb. Digits subcylindrical; subdigital lamellæ smooth, 16 to 18 under the fourth toe. Tail $1\frac{2}{3}$ to $1\frac{3}{4}$ times as long as head and body. Bronzy olive above, with small black spots; sides and limbs closely spotted with black, with small whitish dots; young with a light dorso-lateral line.

From snout to vent 2 inches; tail 3·2.

Hab. Upper Burma (Bhámo and Kakhyen Hills).

227. Lygosoma ladacense.

Eumeces ladacensis, *Günth. Rept. B. I.* p. 88, pl. x, fig. I.
Euprepes stoliczkai *and* kargilensis, *Steind. Novara, Rept.* pp. 45, 46.
Mocoa ladakensis, M. stoliczkæ, *and* M. kargilensis, *Theob. Cat.* pp. viii, 59, 60.
Lygosoma ladacense, *Bouleng. Cat. Liz.* iii, p. 258, pl. xvii, fig. 3.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{2}$ to $1\frac{2}{3}$ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral, and usually also with the frontal; latter shield as long as or a little longer than frontoparietals and interparietal together, in contact with the three anterior supraoculars; 4 supraoculars, second and third

equal; 6 to 8 supraciliaries; frontoparietals and interparietal distinct, subequal; parietals forming a suture behind the interparietal; 3 or 4 pairs of nuchals; fifth or sixth upper labial entering the orbit. Ear-opening oval, much smaller than the eye-opening, with two or three projecting lobules or granules anteriorly. 32 to 38 smooth scales round the middle of the body, laterals smallest. A pair of large præanals. The adpressed limbs meet or overlap. Digits subcylindrical: subdigital lamellæ smooth, 21 to 24 under the fourth toe. Tail a little longer than head and body. Bronzy olive above, with small darker and lighter spots; a more or less dark brown lateral band, dotted with pale olive, sometimes bordered above and below by a light streak; lower surfaces greenish.

From snout to vent 2 inches; tail 2·6.

Hab. Ladák, Upper Indus Valley (12,000–14,000 feet).

228. Lygosoma laterimaculatum.

Lygosoma laterimaculatum, *Bouleng. Cat. Liz.* iii, p. 260, pl. xviii, fig. 2.

Habit lacertiform; distance between end of snout and fore limb contained $1\frac{1}{4}$ to $1\frac{1}{3}$ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield a little shorter than the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, second largest; 7 or 8 supraciliaries; frontoparietals and interparietal distinct, usually subequal; parietals forming a suture behind the interparietal; 3 to 5 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening oval, smaller than the eye-opening, without projecting granules or lobules. 26 or 28 scales round the middle of the body, smooth, or dorsals feebly pluricarinate, dorsals largest, laterals smallest. A pair of enlarged præanals, not much longer than broad. The hind limb reaches the wrist or the elbow. Digits subcylindrical; subdigital lamellæ smooth, 21 to 25 under the fourth toe. Tail $1\frac{2}{3}$ to $1\frac{3}{4}$ times the length of head and body. Bronzy above, with a blackish lateral streak, light-edged above, along the head and body; two fine black lines or series of dots along the back; sides of head and body below the lateral streak largely and closely spotted with black; lower surfaces greyish; tail blue in the young.

From snout to vent 1·8 inches.

Hab. Nilgiri, Travancore, and Tinnevelly Hills, S. India.

229. Lygosoma bilineatum.

Mocoa bilineata, *Gray, A. M. N. H.* xviii, 1846, p. 430; *Theob. Cat.* p. 58.

Eumeces bilineatus, *Günth. Rept. B. I.* p. 85.

Lygosoma bilineatum, *Bouleng. Cat. Liz.* iii, p. 259, pl. xviii, fig. 1.

Body elongate; distance between end of snout and fore limb contained $1\frac{2}{3}$ to 2 times in distance between axilla and groin in the adult, $1\frac{1}{2}$ in the young. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield as long as the frontoparietals and interparietals together or slightly longer, in contact with the first and second supraoculars; 4 supraoculars, second largest; 6 or 7 supraciliaries; frontoparietals and interparietal distinct, usually subequal; parietals forming a suture behind the interparietal; 4 to 5 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening roundish, a little smaller than the eye-opening, with two projecting granules on its anterior border. 22 or 24 smooth scales round the middle of the body, dorsals largest, laterals smallest. 4 large præanals, much longer than broad, pointed behind in the male. The adpressed limbs are widely separated in the adult, slightly overlap in the young. Digits subcylindrical; subdigital lamellæ smooth, 16 to 21 under the fourth toe. Tail $1\frac{1}{4}$ to $1\frac{1}{2}$ times as long as head and body. Bronzy olive or brown above; a black streak on each side, from above the ear to the base of the tail; usually another finer black streak on each side along the back; small black dots on the sides of the head, and usually also below the lateral streak; lower surfaces greenish.

From snout to vent 2·2 inches.

Hab. Nilgiri Hills, S. India.

230. Lygosoma beddomii.

Mocoa travankorica, part., *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 58.

Lygosoma beddomii, *Bouleng. Cat. Liz.* iii, p. 261, pl. xviii, fig. 3.

The distance between the end of the snout and the fore limb contained $1\frac{1}{3}$ to $1\frac{2}{3}$ times in the distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield as long as the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, second largest and touching the supraciliary margin, as sometimes the third does also; 5 to 7 supraciliaries; frontoparietals distinct, longer than the interparietal; parietals forming a suture behind the interparietal; 3 or 4 pairs of nuchals; fifth upper labial entering the orbit. Ear-opening oval, much smaller than the eye-opening, without projecting lobules or granules. 20 or 22 smooth scales round the middle of the body, dorsals largest, laterals smallest. A pair of feebly enlarged præanals, not much longer than broad. The adpressed limbs just meet in the adult, overlap in the young. Digits subcylindrical; subdigital lamellæ smooth, 17 or 18 under the fourth toe. Tail $1\frac{2}{3}$ times the length of head and body.

Bronzy brown above, lighter on the limit of the blackish-brown colour which covers the sides of the head and body; sometimes a blackish vertebral line; limbs dark brown; lower sufaces dark brown or bronzy olive, the scales edged with darker.

From snout to vent 2·25 inches.

Hab. Travancore Hills and Wynaad, S. India.

231. Lygosoma travancoricum.

Mocoa travankorica, part., *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 58.
Lygosoma travancoricum, *Bouleng. Cat. Liz.* iii, p. 261, pl. xviii, fig. 4.

Habit lacertiform; the distance between end of snout and fore limb equals or slightly exceeds the distance between axilla and groin in the young, and is contained $1\frac{2}{5}$ to $1\frac{2}{3}$ times in the adult and halfgrown. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal broader than long, forming a suture with the rostral and with the frontal; latter shield as long as or shorter than frontoparietal and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, second largest; 7 or 8 supraciliaries; frontoparietal single, longer than the interparietal; parietals forming a suture behind the interparietal; 3 or 4 pairs of nuchals; fifth, or rarely fourth, upper labial entering the orbit. Ear-opening oval, much smaller than the eye-opening, without projecting lobules or granules. 22 or 24 smooth scales round the middle of the body, dorsals largest, laterals smallest. A pair of enlarged præanals. The adpressed limbs meet or slightly overlap in the adult. Digits subcylindrical; subdigital lamellæ smooth, 18 to 24 under the fourth toe. Tail $1\frac{3}{5}$ to $1\frac{3}{4}$ times length of head and body. Bronzy brown or olive above, lighter on the limit of the blackish-brown sides; back uniform, or with scattered blackish dots, or with a blackish vertebral line; lower part of sides black-spotted; limbs dark brown; lower surfaces dark grey or olive.

From snout to vent 2·4 inches.

Hab. Hills of Southern India (Wynaad, Travancore, Palni, Sivagiri Ghat).

232. Lygosoma macrotympanum.

Mocoa macrotympanum, *Stoliczka, J. A. S. B.* xlii, 1873, p. 166.
Lygosoma macrotympanum, *Bouleng. Cat. Liz.* iii, p. 265.

Body moderately slender. Snout rather attenuated and prolonged. Lower eyelid with an undivided transparent disk. Nostril pierced in the nasal; no supranasal; frontonasal in contact with the rostral, posteriorly just touching the frontal; 4 supraoculars; frontoparietal single; interparietal distinct; parietals forming a suture behind the interparietal; 4 pairs of nuchals; fifth upper

labial under the orbit. Ear-opening very large, rounded, with a perfectly smooth edge all round. 22 smooth scales round the middle of the body, dorsals slightly larger than laterals. A pair of moderately enlarged præanals. Limbs proportionately developed, with the toes very slender. Head above brown, paler on the snout: 3 longitudinal white bands along the body, separated by 2 somewhat broader brown bands; the median dorsal white band becomes obsolete at the root of the tail; labials and sides of head brownish, spotted with white; limbs above with very close longitudinal brown lines, digits powdered with pure white; lower portion of the sides and lower surfaces livid carneous, tinged with bright orange on the lower belly and on the tail.

Total length 4 inches, of which the tail measures nearly 2·5.

Hab. South Andaman. A single specimen, which I have not seen, was obtained on a sandy beach in Macpherson's Straits.

233. Lygosoma macrotis.

Euprepes macrotis, *Steind. Novara, Rept.* p. 48.
Mocoa macrotis, *Theob. Cat.* p. 60.
Lygosoma macrotis, *Bouleng. Cat. Liz.* iii, p. 265.

Lower eyelid with an undivided transparent disk. No supranasals; rostral large, posterior border convex and forming a curved suture with the frontonasal, which is in contact posteriorly with the anterior angle of the frontal; frontoparietals and interparietal distinct. Ear-opening very large, circular, without projecting lobules. 31 smooth scales round the body. A pair of large præanals. Brown above, with a deep black lateral band; belly yellowish white.

Hab. Nicobars. I have not seen this lizard.

The following species is insufficiently described:—

Mocoa formosa, Blyth, J. A. S. B. xxii, 1853, p. 651; Theob. Cat. Rept. Mus. As. Soc. p. 26; id. Cat. p. 58.

"Length 7 in., of which the tail measures half. Scales hexagonal, in 6 dorsal series. Præanal scales similar to the abdominal. Form robust. Frontal shield elongate-pentagonal, broadest to the front, and rounded posteriorly. Internasal and frontonasals lozenge-shaped, or somewhat fan-shaped, broader than long. Frontoparietals distinct, but unsymmetrically divided. Colour olive-green, with black lateral and pale superlateral bands as usual, the former much speckled with greenish white, and the latter showing a series of black spots. Between the pale superlateral streaks are five narrow black lines along the nape and body, variegated with angular greenish-white spots. A few such spots appear also on the upper surface of the tail, caused by a scale variegated with black and greenish white here and there placed. Limbs minutely pencilled with black, and spots or streaks of the same upon the head. Underparts greenish-plumbeous throughout."

Hab. Mirzapur (N.W.P.), and Wazirabad, Punjab.

234. Lygosoma taprobanense.

Eumeces taprobanensis, *Kelaart, Prodr.* ii, p. 21.
Eumeces taprobanensis, part., *Günth. Rept. B. I.* p. 89, pl. xiii, fig. B.
Hinulia taprobanensis, part., *Theob. Cat.* p. 56.
Lygosoma taprobanense, *Bouleng. Cat. Liz.* iii, p. 319.

Body rather elongate, limbs short; distance between end of snout and fore limb contained about once and a half in distance between axilla and groin. Snout very short, obtusely acuminate. Lower eyelid scaly. Nostril pierced in a single nasal; no supranasal; frontonasal broader than long, forming a broad suture with the rostral, and usually in contact posteriorly with the anterior angle of the frontal: the latter shield considerably longer than the fronto-parietals, in contact with the two anterior supraoculars; 4 supra-oculars; 8 or 9 supraciliaries; frontoparietals distinct, about as large as the interparietal; parietals forming a suture behind the interparietal; no nuchals; usually, fifth labial below the centre of the eye. Ear-opening small, suboval, with 2 or 3 very small, more or less indistinct, projecting lobules anteriorly. 24 or 26 smooth equal scales round the middle of the body. Præanals not enlarged. The adpressed limbs fail to meet. Digits short, cylindrical; sub-digital lamellæ smooth or tubercular, 13 to 19 under the fourth toe. Tail thick, once and a half the length of head and body. Yellowish or reddish brown above, usually with a paler brown dorso-lateral band and longitudinal series of blackish dots; sides dark brown or blackish, white-dotted; lower surfaces yellowish; throat, in males, bluish grey, with or without white dots.

From snout to vent 2·25 inches; tail 3·25.

Hab. Ceylon.

235. Lygosoma fallax.

Lygosoma fallax, *Peters, MB. Ak. Berl.* 1860, p. 184; *Bouleng. Cat. Liz.* iii, p. 320.
Eumeces taprobanensis, part., *Günth. Rept. B. I.* p. 89.
Hinulia taprobanensis, part., *Theob. Cat.* p. 56.

Body rather elongate, limbs short; distance between end of snout and fore limb contained about once and a half in distance between axilla and groin. Snout very short, obtusely acuminate. Lower eyelid scaly. Nostril pierced in a single nasal; no supranasal; frontonasal much broader than long, forming a broad suture with the rostral; præfrontals usually forming a median suture; frontal as long as the frontoparietal or shorter, in contact with the two anterior supraoculars; 4 supraoculars; 8 or 9 supraciliaries; fronto-parietals united into a single shield, much longer than the inter-parietal; parietals forming a suture behind the interparietal; no nuchals; usually, fifth labial below the centre of the eye. Ear-opening small, roundish, with two very small projecting lobules anteriorly. 26 smooth, equal scales round the middle of the body. Præanals not enlarged. The adpressed limbs fail to meet or just

meet. Digits short, cylindrical; subdigital lamellæ smooth or tubercular, 16 to 18 under the fourth toe. Tail thick, $1\frac{1}{3}$ to $1\frac{2}{3}$ times the length of head and body. Pale reddish brown above, uniform or with darker dots, and with a more or less distinct darker and a lighter dorso-lateral band; lower surfaces yellowish. Throat and sides of head and neck, in males, bluish-black, dotted with white.

From snout to vent 1·6 inches; tail 2·7.

Hab. Ceylon.

236. Lygosoma lineolatum.

Riopa lineolata, *Stoliczka, J. A. S. B.* xxxix, 1870, p. 175, pl. x, fig. 2; *Theob. Cat.* p. 63.
Lygosoma lineolatum, *Bouleng. Cat. Liz.* iii, p. 314.

Body much elongate, limbs short; distance between end of snout and fore limb contained about twice and a half in distance between axilla and groin. Snout short, obtuse. Lower eyelid scaly. Supranasals distinct, in contact behind the rostral; frontonasal very broad, forming a narrow suture with the frontal; the latter shield as long as the frontoparietal and interparietal together; 5 supraoculars, last very small; frontoparietal fused into a single shield; interparietal rather small and triangular; parietals forming a suture behind the interparietal. Ear-opening moderate, rounded, simple. 24 or 25 smooth scales round the middle of the body. Præanals very slightly enlarged. The length of the hind limb equals the distance between the axilla and the eye. Fourth toe very slightly longer than third. Tail about once and one third the length of head and body. Greenish iridescent brown above, with an almost continuous series of small dark brown dots on each side of the back, beginning at the nape and margined above and below by a pale line; the centres of all the scales above and on the sides are paler than at the edges, and form straight longitudinal lines. Below whitish, with a vinaceous tinge, and distinctly reddish on the tail.

From snout to vent 1·5 inches; tail 2.

Hab. Martaban, opposite to Moulmein, Burma. Only two specimens, which I have not seen, are known.

237. Lygosoma comotti.

Lygosoma comotti, *Bouleng. Ann. Mus. Genova,* (2) iv, 1887, p. 622.

Body moderately elongate, limbs short; distance between end of snout and fore limb contained once and three fifths in distance between axilla and groin. Head much depressed; snout short, obtuse. Lower eyelid scaly. Supranasals present, forming a suture behind the rostral; frontonasal broader than long, forming a broad suture with the frontal; latter shield as long as frontoparietals and parietals together, in contact with the first and second supraoculars; 4 supraoculars; 8 supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietals forming a suture behind the interparietal; no enlarged nuchals; sixth upper labial below

the centre of eye. Ear-opening small, hardly as large as the pupil, round, with a projecting lobule anteriorly. 28 smooth, subequal scales round the middle of the body. No enlarged præanals. The adpressed limbs fail to meet; the fore limb stretched forwards reaches a little beyond the ear; hind limb half the distance between axilla and groin. Fourth toe longer than third; subdigital lamellæ obtusely keeled, 15 under the fourth toe. Rufous above, each scale edged with dark brown; sides brown, with yellowish spots; lower parts uniform yellowish.

From snout to vent 2·25 inches.

Hab. Minhla, Upper Burma.

238. Lygosoma albopunctatum.

Riopa albopunctata, *Gray, A. M. N. H.* xviii, 1846, p. 430; *Theob. Cat.* p. 62.
Eumeces punctatus, *Cantor, J. A. S. B.* xvi, 1847, p. 651.
Eumeces albopunctatus, *Günth. Rept. B. I.* p. 92.
Lygosoma albopunctatum, *Bouleng. Cat. Liz.* iii, p. 309.

Body elongate, limbs weak; distance between end of snout and fore limb contained 2 to 2⅓ times in the distance between axilla and groin. Snout short, obtuse. Lower eyelid scaly. Supranasals present, in contact behind the rostral; frontonasal much broader than long, in contact with the frontal; præfrontals small; frontal as long as the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars; 7 or 8 supraciliaries, first and last largest; frontoparietals distinct, larger than the interparietal; parietals forming a suture behind the interparietal; nuchals frequently indistinct; fifth upper labial below the centre of the eye. Ear-opening small, oval, with one or two small lobules anteriorly. 26 or 28 scales round the middle of the body, all smooth, subequal. Marginal præanals scarcely enlarged. The fore limb stretched forwards reaches the ear or a little beyond; the length of the hind limb is contained 2½ to 3 times in the distance between axilla and groin. Fourth toe longer than third; subdigital lamellæ feebly unicarinate, 12 to 15 under the fourth toe. Tail thick, a little longer than head and body. Pale brown or rufous above, sides closely dotted with black; each dorsal and nuchal scale with a more or less distinct dark brown dot, forming longitudinal series; sides of neck and anterior part of body white-spotted; lower surfaces yellowish white.

From snout to vent 2·5 inches.

Hab. Southern India, Lower Godávari valley, Bilaspur, Bengal, Assam, Burma, Malay Peninsula.

239. Lygosoma punctatum.

Lacerta punctata, *Linn. Syst. Nat.* i, p. 369.
Riopa hardwickii, *Gray, Cat. Liz.* p. 96; *Theob. Cat.* p. 63.
Eumeces hardwickii, *Günth. Rept. B. I.* p. 92.
Lygosoma punctatum, *Bouleng. Cat. Liz.* iii, p. 310.

Body elongate, limbs weak; distance between end of snout and fore limb contained 2 to 2½ times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals distinct, in contact behind the rostral; frontonasal much broader than long, forming a suture with the frontal; præfrontals small; frontal about as long as the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars; usually 7 supraciliaries; frontoparietals distinct, usually a little larger than interparietal; parietals forming a suture behind the interparietal; a pair of nuchals and a pair of temporals border the parietals; fifth upper labial below the eye. Ear-opening small, oval, with one or two small lobules anteriorly. 24 or 26 scales round the middle of the body, all smooth, subequal. Marginal præanals not, or scarcely enlarged. The fore limb, when stretched forwards, reaches a little beyond the ear; the length of the hind limb is more than one third of the distance between axilla and groin. Digits feebly compressed; fourth toe longer than third; subdigital lamellæ feebly unicarinate, 11 to 14 under the fourth toe. Tail thick, as long as head and body, or a little longer. Brown or olive above, each scale with a dark brown spot; these spots sometimes confluent into longitudinal lines; a more or less marked yellowish streak or band on each side, beginning on the canthus rostralis; sides sometimes blackish brown, white-dotted; lower surfaces yellowish white, uniform, or each scale with a black central dot; tail reddish in the young.

From snout to vent 3·5 inches.

Hab. India, from the base of the Himalayas, rarer in the northern parts; Ceylon.

240. Lygosoma guentheri.

Riopa punctata, *Gray, Ann. N. H.* ii, 1839, p. 332; *Theob. Cat.* p. 64.
Eumeces punctatus, *Günth. Rept. B. I.* p. 93.
Eumeces guentheri, *Peters, Sitzb. Ges. Naturf. Freunde*, 1879, p. 36.
Lygosoma guentheri, *Bouleng. Cat. Liz.* iii, p. 311.

Body much elongate, limbs weak; distance between end of snout and fore limb contained about three times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals present, in contact behind the rostral; frontonasal much broader than long, forming a suture with the frontal; præfrontals small and widely separated; frontal usually as long as frontoparietals and interparietal together or a little longer, in contact with the first and second supraoculars; 4 supraoculars; 6 to 8 supraciliaries, first and last largest; frontoparietals distinct, usually larger than the interparietal; parietals forming a suture behind the interparietal; a pair of nuchals and a pair of temporals border the parietals; usually, fifth upper labial below the eye. Ear-opening small, roundish or oval. 24 or 26 scales round the middle of the body, all smooth, subequal. Marginal præanals not or scarcely enlarged. The fore limb, when

stretched forwards, reaches the ear or not quite so far; the length of the hind limb is contained four times or a little more in the distance between axilla and groin. Digits feebly compressed; fourth toe longer than third; subdigital lamellæ feebly unicarinate, 13 or 14 under the fourth toe. Tail thick, considerably longer than head and body. Brownish or yellowish olive above, each scale with a black spot; these spots sometimes confluent into longitudinal lines; sometimes a more or less distinct light dorso-lateral band; the black spots usually larger on the sides, and sometimes intermixed with white ones; lower surfaces yellowish white, usually with a black dot on each scale.

From snout to vent 4 inches; tail 5·5.

Hab. Southern India, Bombay, and the Deccan.

241. Lygosoma feæ.

Lygosoma feæ, *Bouleng. Ann. Mus. Genova,* (2) iv, 1887, p. 623.

Body elongate, limbs short; distance between end of snout and fore limb contained twice in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals distinct, in contact behind the rostral; frontonasal twice as broad as long, forming a suture with the frontal; the latter shield about as large as a frontoparietal or the interparietal, in contact with the first and second supraoculars; 4 supraoculars; 7 supraciliaries; frontoparietals and interparietal distinct, subequal in size; parietals forming a suture behind the interparietal; a pair of nuchals and a pair of temporals border the parietals; fifth upper labial below the centre of the eye. Ear-opening small, round. 22 smooth equal scales round the middle of the body. No enlarged præanals. The fore limb stretched forwards reaches a little beyond the ear; the hind limb measures one third the distance between axilla and groin. Fourth toe a little longer than third; subdigital lamellæ smooth, 10 under the fourth toe. Tail thick, a little longer than head and body. Yellowish brown above, each scale edged with darker; a yellowish dorso-lateral streak; lower surfaces whitish.

From snout to vent 1·3 inches; tail 1·6.

Hab. Rangoon, Burma.

242. Lygosoma cyanellum.

Riopa anguina, part., *Theobald, Journ. Linn. Soc.* x, 1868, p. 27.
Riopa cyanella, *Stoliczka, J. A. S. B.* xli, 1872, p. 130, pl. v, fig. 3; *Theob. Cat.* p. 65.
Lygosoma cyanellum, *Bouleng. Cat. Liz.* iii, p. 312.

Very closely allied to *L. anguinum*, but the limbs a little longer. The fore limb reaches slightly beyond the ear, and the length of the hind limb is contained $3\frac{1}{2}$ times in the distance between axilla and groin. Fourth toe slightly longer than third. The frontal a little longer and forming a very short suture with the

frontonasal. Colour above olive-brown, with an iridescent blue tinge, purer brownish on the tail, pale brownish olive at the sides of the body; each scale, above and at the side, is indistinctly mottled with dark, and there are generally a few white spots on the sides of the neck and about the shoulder; a narrow white, slightly black-margined band rises from behind the orbit and continues on each side of the back; it becomes indistinct in the middle of the body, but is again slightly more conspicuous above the hip, gradually disappearing on the tail, which is indistinctly speckled with dark brown at the sides.

From snout to vent 2 inches.

Hab. Pegu.

243. Lygosoma anguinum.

Riopa anguina, part., *Theobald, Journ. Linn. Soc.* x, 1868, p. 27.
Riopa anguina, *Stoliczka, J. A. S. B.* xli, 1872, p. 130, pl. v, fig. 4; *Theob. Cat.* p. 64.
Lygosoma anguinum, *Bouleng. Cat. Liz.* iii, p. 313.

Body much elongate, limbs very weak; distance between end of snout and fore limb contained $2\frac{1}{2}$ to 3 times in the distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals distinct, in contact behind the rostral; frontonasal about twice as broad as long, forming a suture with the frontal; præfrontals small and widely separated; frontal a little shorter than frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars; 7 supraciliaries, first and last largest; frontoparietals distinct, a little larger than interparietal; parietals forming a suture behind the interparietal; a pair of nuchals and a pair of temporals border the parietals; fifth upper labial below the centre of the eye. Ear-opening small, roundish. 22 scales round the middle of the body, all smooth, subequal. Marginal præanals scarcely enlarged. The fore limb, when stretched forwards, does not reach the ear; the length of the hind limb is contained 4 to 5 times in the distance between axilla and groin. Digits very short; third and fourth toes equal. Uniform olive-brown or rufous above, lighter beneath.

From snout to vent 2·2 inches.

Hab. Pegu.

244. Lygosoma calamus.

Lygosoma calamus, *Bouleng. Cat. Liz.* iii, p. 314, pl. xxv, fig. 1.

Body much elongate, limbs short; distance between end of snout and fore limb contained 3 times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals distinct, in contact behind the rostral; frontonasal about twice as broad as long, forming a narrow suture with the frontal; the latter small, hardly as long as the

frontoparietal, and narrower, in contact with the first and second supraoculars; 4 supraoculars; 7 supraciliaries, first and last largest; frontoparietals fused into a single large shield; interparietal distinct, rather large; parietal forming a suture behind the interparietal; a pair of nuchals and a pair of temporals border the parietals; fifth upper labial below the centre of the eye. Ear-opening small, roundish. 22 scales round the middle of the body, equal, perfectly smooth. Marginal præanals scarcely enlarged. The fore limb when stretched forwards hardly reaches the ear; the hind limb measures about one fourth the distance between axilla and groin. Digits feebly compressed; fourth toe very slightly longer than third; subdigital lamellæ smooth, 11 under the fourth toe. Yellowish brown above; a dark brown lateral band, edged above by a yellowish line; lower surfaces yellowish.

From snout to vent 1·8 inches.

Hab. Minhla, Burma.

245. Lygosoma lineatum.

Chiamela lineata, *Gray, Ann. N. H.* ii, 1839, p. 333; *Günth. Rept. B. I.* p. 95; *Theob. Cat.* p. 66.
Hagria vosmaerii, *Gray, l. c.* p. 333; *Günth. Rept. B. I.* p. 94; *Theob. Cat.* p. 67.
Campsodactylus lamarrei, *Dum. & Bibr. Erp. Gén.* v, p. 762.
Lygosoma vosmaerii, *Bouleng. Cat. Liz.* iii, p. 315, pl. xxv, fig. 2.
Lygosoma lineatum, *Bouleng. l. c.* fig. 3.

Body much elongate; limbs very short, tetradactyle; distance between end of snout and fore limb contained 3½ to 4 times in distance between axilla and groin. Snout short, obtuse. Lower eyelid with an undivided transparent disk. Supranasals present, in contact behind the rostral; frontonasals much broader than long, forming a broad suture with the frontal; præfrontals small, widely separated; frontal shorter than the interparietal, in contact with the first and second supraoculars; 4 supraoculars; 6 or 7 supraciliaries; frontoparietals fused into a single large shield; interparietal distinct, not much shorter than the frontal; parietals forming a suture behind the interparietal; no nuchals; fourth and fifth upper labials below the eye. Ear-opening very small. 22 smooth, subequal scales round the middle of the body. Præanals not enlarged. Third and fourth toes equal; subdigital lamellæ smooth. Yellowish brown, each scale with a dark brown spot forming longitudinal lines, which are less marked below than above.

From snout to vent 2·25 inches; tail 2·8.

Hab. The Deccan (Poona, Belgaum, Matherán). The unique type of *Hagria vosmaerii* or *Campsodactylus lamarrei*, stated to be from Bengal, is apparently an anomalous specimen of this species, with five fingers instead of four.

Under the name of *Euprepes halianus* (Nevill, Taprobanian, ii, 1887, p. 56), a Scink has been described which probably belongs to the genus *Lygosoma*. Its characters are given as follows:—

"A pair of very narrow supranasal shields; the single præfrontal touches both rostral and vertical [frontal]. The fifth upper labial is below the eye, a little longer than high. Ear-opening small, with no lobules. Lower eyelid scaly. Scales with four very weak keels anteriorly, becoming strong posteriorly, reduced to three on the tail, in 30 or 31 longitudinal series between the limbs, and 24 transverse series *. Præanal scales not enlarged; subcaudals rather longer than the others. Limbs of moderate strength. Third toe nearly as long as fourth. White, back with ten black bands—one on the nape, one between the fore limbs, three on the back, one between the hind limbs, and four on the tail with remains of a fifth. Black bands run from the nostril through the eyes, which are connected by a band across the occiput; this band throws forward a band each side of the vertical."

Hab. Hot and dry districts of Ceylon.

Genus ABLEPHARUS,

Fitzinger, Verh. Ges. Naturf. Fr. i, 1824, p. 297.

Palatine and pterygoid bones in contact mesially, the palatal notch not extending forwards to between the centre of the eyes; pterygoids toothless. Maxillary teeth conical. No movable eyelids; a transparent disk covering the eye. Ear distinct or hidden. Nostrils pierced in the nasal; supranasal (present or) absent. Limbs more or less developed.

Distribution. Hotter parts of both hemispheres. 16 species are known, two of which occur in North-western India.

Synopsis of Indian Species.

Ear-opening small, but distinct. . . . . *A. brandtii*, p. 213.
Ear hidden . . . . *A. grayanus*, p. 214.

246. Ablepharus brandtii.

Ablepharus brandtii, *Strauch, Mél. biol. Ac. St. Pétersb.* vi, 1868, p. 565, *and Bull.* xii, p. 368; *Blanf. Zool. E. Pers.* p. 391, pl. xxvii, fig. 1; *Murr. Zool. Sind*, p. 354; *Bouleng. Cat. Liz.* iii, p. 351.
Blepharosteres agilis, *Stoliczka, P. A. S. B.* 1872, p. 126; *Theob. Cat.* p. 62.

Snout short, obtuse, rostral not projecting. Eye surrounded by a circle of small scales, the two upper of which are much larger than the others. Rostral largely in contact with the frontonasal,

* Is not "longitudinal" a *lapsus* for "transverse" and *vice versâ*?

which is in contact with the frontal; the latter moderately large, in contact with the first and second supraoculars; frontoparietal single; interparietal distinct; 3 or 4 supraoculars, first largest; 5 small supraciliaries, first largest; two pairs of nuchals; 4 labials anterior to the subocular. Ear-opening very small. 20 or 22 scales round middle of body, dorsals largest. Two enlarged præanals. Limbs short, pentadactyle, not meeting when adpressed. Tail longer than head and body. Olive above, with a dark brown lateral band edged above by a light line.

From snout to vent 1·2 inches; tail 1·75.

Hab. Punjab, Sind, Baluchistan, Samarkand, Bokhara, Mesopotamia.

247. Ablepharus grayanus.

Blepharosteres grayanus, *Stoliczka, P. A. S. B.* 1872, p. 74; *Theob. Cat.* p. 61; *Murr. Zool. Sind*, p. 354.
Ablepharus grayanus, *Bouleng. Cat. Liz.* iii, p. 352.

Snout short, obtuse, rostral not projecting. Eye surrounded by a circle of small scales, the two upper of which are much larger than the others. Rostral largely in contact with the frontonasal, which is in contact with the frontal; 3 supraoculars, followed by 2 small ones, obliquely descending on the temporal region; frontoparietal single; interparietal distinct; 4 labials anterior to the subocular. Ear hidden. 18 or 20 scales round middle of body. Two enlarged præanals. Limbs short, pentadactyle. Above pale olive-green, with a very distinct metallic lustre, a little darker at the sides, speckled with black, and gradually passing into the uniform greenish-white lower side; a silvery green narrow band from the supraciliary edge to the base of the tail, edged with black below; limbs brown above, marked with rows of white spots; tail with a pink tinge.

From snout to vent 1·25 inches.

Hab. Cutch and Sind.

Genus RISTELLA,

Gray, Ann. N. H. ii, 1839, p. 333.

Palatine and pterygoid bones in contact on the median line of the palate, which is toothless; palatine notch small, far behind, corresponding to the posterior notch of the tongue. Teeth conical. Eyelids well developed, scaly. Ear-opening distinct. Nostril pierced in a single nasal; no supranasals; præfrontals small or coalesced; frontoparietals and interparietal distinct. Limbs well-developed, anterior with 4, posterior with 5 digits; claws completely retractile into a large compressed sheath formed of one large scale cleft beneath.

Distribution. Hill-tracts of Southern India.

Synopsis of the Species.

A. A pair of small præfrontals; frontonasal forming a suture with frontal.
- *a.* Ear-opening much larger than nostril; dorsal scales feebly bi- or tricarinate .. *R. rurkii*, p. 215.
- *b.* Ear-opening not, or but slightly, larger than nostril; dorsal scales sharply bicarinate. *R. travancorica*, p. 216.

B. Two azygos shields between rostral and frontal.
- *a.* 22 to 24 scales round middle of body; adpressed limbs not meeting .... *R. guentheri*, p. 216.
- *b.* 26 scales round body; adpressed limbs meeting or overlapping .... *R. beddomii*, p. 216.

a *b*

Fig. 57.—Foot of *Ristella rurkii*. *a.* Upper view. *b.* Lower view.

248. Ristella rurkii.

Ristella rurkii, *Gray, Ann. N. H.* ii, 1839, p. 333; *Günth. P. Z. S.* 1875, p. 225; *Bouleng. Cat. Liz.* iii, p. 357, pl. xxix, fig. 1.

Ateuchosaurus travancoricus, part., *Beddome, Madras Journ. Med. Sc.* 1870.

Ristella travancorica, *Bedd. op. cit.* 1871 (part.); *Stoliczka, J. A. S. B.* xli, 1872, p. 129, pl. iv, fig. 5; *Theob. Cat.* p. 54.

Head small; snout short, obtuse. Ear-opening much larger than the nostril. Frontonasal broader than long, widely separating the nasals; præfrontals present, widely separated; frontal shorter than frontoparietals and interparietal together; 5 supraoculars, 3 anterior in contact with the frontal; 10 supraciliaries; parietals forming a suture behind the interparietal; no nuchals; third, fourth, and fifth upper labials below the eye, from which they are separated by a series of small scales. 26 scales round the middle of the body, laterals a little smaller than dorsals and ventrals, dorsals and laterals feebly bi- or tricarinate. Præanal scales not or scarcely enlarged. Limbs short, widely separated when adpressed; third and fourth toes equal. Tail cylindrical, $1\frac{1}{2}$ to $1\frac{2}{3}$ times the length

of head and body. Back reddish brown; each dorsal scale with a small blackish spot or shaft, sometimes confluent and forming 6 longitudinal lines; sides blackish brown, dotted with whitish; lower surfaces whitish, throat and tail usually brown-spotted.

From snout to vent 1·6 inches; tail 2·75.

Hab. Anaimalai hills, S. India.

249. Ristella travancorica.

Ateuchosaurus travancoricus, part., *Beddome, Madras Journ. Med. Sc.* 1870.

Ristella travancorica, *Beddome, op. cit.* 1871 (part.); *Bouleng. Cat. Liz.* iii, p. 358, pl. xxix, fig. 2.

Ear-opening not or but slightly larger than the nostril; third to sixth upper labials below the eye. Dorsal scales sharply bicarinate; 24, rarely 26, scales round the middle of the body. Otherwise as in *R. rurkii.* Reddish brown above, each dorsal scale usually with a dark brown dot; usually a rather indistinct darker lateral band; lower surfaces uniform whitish.

From snout to vent 1·5 inches.

Hab. Travancore hills.

250. Ristella guentheri.

Ristella guentheri, *Bouleng. Cat. Liz.* iii, p. 358, pl. xxix, fig. 3.

Ear-opening little larger than the nostril; a single azygos præfrontal, nearly as large as the frontonasal; third to sixth upper labials below the eye. Dorsal scales sharply bicarinate; 22 or 24 scales round the middle of the body. Reddish brown above, with dark brown lines along the series of scales, or with minute yellowish dots; sides dark brown, dotted with yellowish, or with a dark brown longitudinal band; young with three light, dark-edged dorsal streaks; lower surfaces uniform whitish.

From snout to vent 1·5 inches.

Hab. Madura, Sirumalai hills.

251. Ristella beddomii.

Ristella beddomii, *Bouleng. Cat. Liz.* iii, p. 359, pl. xxix, fig. 4.

Ear-opening larger than the nostril; a single azygos præfrontal, nearly as large as the frontonasal; fourth to sixth upper labials below the eye. Body much shorter than in the other species of the genus, the adpressed limbs meeting or slightly overlapping. Dorsal scales sharply bicarinate. 26 scales round the middle of the body. Reddish brown above, with or without 2 or 3 lighter dorsal streaks; sides with scattered minute whitish dots; usually a black blotch with a few white dots above the axilla; lower surfaces uniform whitish.

From snout to vent 1·25 inches.

Hab. Hills of South-western India.

Genus TROPIDOPHORUS,

Dum. & Bibr. Erp. Gén. v, p. 554, 1839.

Palatine and pterygoid bones in contact on the middle line of the palate, which is toothless. Teeth conical. Eyelids well developed, scaly. Tympanum distinct, superficial. Nostril pierced in a single nasal; no supranasals; præfrontals well developed; frontoparietal present, single or double; interparietal distinct. Limbs well developed, pentadactyle; digits cylindrical, with transverse lamellæ beneath.

Distribution. Burma, Southern China, Cochin China, Philippine Islands, Borneo. A genus of 8 species.

Synopsis of Burmese Species.

36 to 40 scales round middle of body, dorsals keeled	*T. berdmorii*, p. 217.
32 to 34 scales round middle of body, all smooth in the adult	*T. yunnanensis*, p. 217.

252. Tropidophorus berdmorii.

Aspris berdmorei, *Blyth, J. A. S. B.* xxii, 1853, p. 651.
Tropidophorus berdmorei, *Theob. Cat.* p. 48; *Bouleng. Cat. Liz.* iii, p. 362.

Upper head-shields smooth; a single frontonasal, longer than broad; præfrontals forming a short median suture, or their inner angles meeting; frontal as long as frontoparietals and interparietal together; 4 supraoculars, first longest; 6 or 7 supraciliaries, anterior to the fourth supraocular, which borders the eye; frontoparietals shorter than the interparietal; parietals forming a suture behind the interparietal; fourth upper labial largest and entering the orbit; an azygos postmental. Tympanum nearly as large as the eye-opening. 36 to 40 scales round the middle of the body, laterals smallest, dorsals and laterals keeled, not mucronate, ventrals smooth. A pair of large præanals. The hind limb reaches the wrist. Subdigital lamellæ smooth. Tail compressed, a little longer than head and body, scaled like the body. Brown above, back and tail with yellowish, dark-edged irregular cross bars or alternating spots; sides with a series of more or less distinct whitish, black-edged round spots; lips dark brown, with whitish spots or vertical lines; belly yellowish, lower surface of tail, and often also the throat, variegated with dark brown.

From snout to vent 3·5 inches; tail 3·5.

Hab. Pegu, Tenasserim.

253. Tropidophorus yunnanensis.

Tropidophorus berdmorei (*non Blyth*), *Anders. An. Zool. Res. Yunnan*, p. 796, pl. lxxvi, fig. 3.
Tropidophorus yunnanensis, *Bouleng. Cat. Liz.* iii, p. 362.

Differs from the preceding in having, when adult, all the scales perfectly smooth and in 32 to 34 longitudinal rows. Dorsal scales bi- or tricarinate in the young.

Hab. Hotha valley, Yunnan; Kakhyen hills.

Genus EUMECES,

Wiegmann, Herp. Mex. p. 36, 1834.

Palatine bones not meeting on the median line of the palate; pterygoids toothed. Lateral teeth conical or with spheroidal crowns. Eyelids well developed, scaly. Tympanum distinct, deeply sunk. Nostril pierced in the nasal; supranasals present; præfrontals, frontoparietals, and interparietal distinct. Limbs well developed, pentadactyle; digits subcylindrical or compressed, with transverse lamellæ beneath, not serrated laterally.

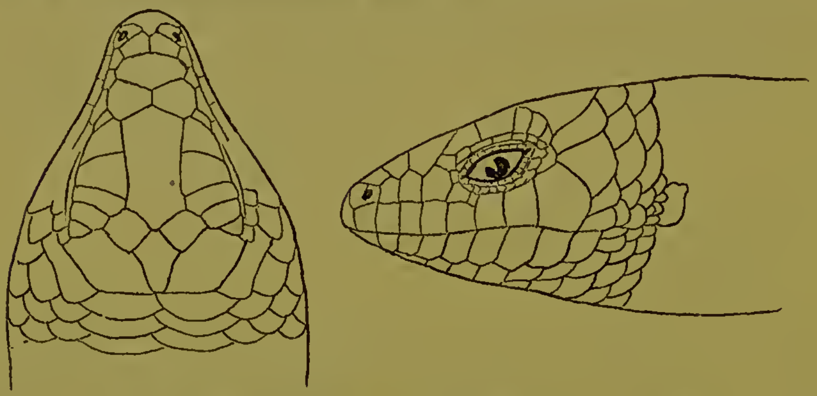

Fig. 58.—Upper and side views of head of *Eumeces scutatus.*

Distribution. North and Central America; Eastern and South-western Asia; North Africa.

31 species are known, mostly American. Three occur in North-western India, and one in Baluchistan.

Synopsis of Indian Species.

A. A median series of transversely enlarged dorsal scales.
- *a.* 21 or 23 scales round body; two azygos postmentals .... *E. scutatus*, p. 218.
- *b.* 17 or 19 scales round body; a single postmental .... *E. tæniolatus*, p. 219.

B. Longitudinal series of dorsal scales in even number.
- *c.* 24 to 28 scales round body; two azygos postmentals .... *E. schneideri*, p. 219.
- *d.* 30 scales round body; a single postmental.. *E. blythianus*, p. 220.

254. Eumeces scutatus.

Plestiodon scutatus, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 25.
Mabouia tæniolata (*non Blyth*), *Anders. P. A. S. B.* 1871, p. 184.

Eumeces tæniolatus, *Stoliczka, P. A. S. B.* 1872, p. 75; *Theob. Cat* p. 65; *Murray, Zool. Sind*, p. 356.
Eumeces scutatus, *Bouleng. Cat. Liz.* iii, p. 382.

Head small; snout short, obtuse. Nasal moderate, divided, nostril pierced above centre of first labial; 3 loreals, anterior in contact with the supranasal and the frontonasal; 5 supraoculars, the 3 anterior in contact with the frontal; parietals entirely separated by the interparietal, which touches the frontal; 4 or 5 pairs of nuchals; eighth upper labial largest; ear-opening moderately large, with two or three small obtuse lobules anteriorly: two azygos postmentals. 21 or 23 scales round the middle of the body, the vertebral series composed of a row of large transverse scales five times as broad as long; lateral scales smallest. The length of the hind limb is contained $3\frac{1}{2}$ to $3\frac{3}{4}$ times in the length from snout to vent; limbs widely separated when adpressed. A median series of transversely enlarged subcaudals. Pale brown above, with three broad dark brown longitudinal bands, the laterals with small whitish spots; lower surfaces yellowish white.

From snout to vent 4 inches; tail 4·5.

Hab. Sind, Cutch, Punjab, Kashmir.

255. Eumeces tæniolatus.

Eurylepis tæniolatus, *Blyth, J. A. S. B.* xxiii, 1854, p. 740.
Eumeces tæniolatus, *Bouleng. Cat. Liz.* iii, p. 383.

Head small; snout short, obtuse. Nasal very small, nostril pierced above the suture between the rostral and the first labial; a postnasal; 2 loreals, anterior in contact with the second labial and the frontonasal; 5 supraoculars, the 2 anterior in contact with the frontal; parietals in contact behind the interparietal; 4 pairs of nuchals; seventh upper labial largest; ear-opening moderately large, with two or three obtuse lobules anteriorly; a single postmental. 17 or 19 scales round the middle of the body, the vertebral series composed of a row of large transverse scales four times as broad as long; lateral scales smallest. The length of the hind limb is contained 4 times in the length from snout to vent; limbs widely separated when adpressed. A median series of transversely enlarged subcaudals. Light brown above, each scale with a dark brown centre forming longitudinal streaks; upper surface of head and lips spotted with dark brown.

From snout to vent 4·5 inches; tail 7.

Hab. Punjab Salt Range.

256. Eumeces schneideri.

Scincus schneideri, *Daud. Rept.* iv, p. 291.
Eumeces pavimentatus, *Blanf. Zool. E. Pers.* p. 387.
Eumeces schneideri, *Bouleng. Cat. Liz.* iii, p. 383.

Head moderate; snout short, obtuse. Nasal rather large, usually

divided, in contact with the two anterior upper labials; no postnasal; 5 supraoculars, the three anterior in contact with the frontal; parietals entirely separated by the interparietal; 4 or 5 pairs of nuchals; ear-opening rather large, with 4 or 5 long pointed lobules anteriorly; 2 azygos postmentals. 22 to 28 scales round the middle of the body, perfectly smooth, the laterals smallest, those of the two median dorsal series very broad and larger than the ventrals. The length of the hind limb is contained $2\frac{1}{2}$ to 3 times in the length from snout to vent; when pressed against the body the limbs just meet or fail to meet. A series of transversely enlarged subcaudals. Olive-grey or brownish above, uniform or with irregular golden-yellow spots or longitudinal streaks; a yellowish lateral streak, extending from below the eye to the hind limb, is constant; lower surfaces yellowish white.

From snout to vent 6·5 inches; tail 8.

Hab. North-east Africa and Syria to Baluchistan.

257. Eumeces blythianus.

Mabouia blythiana, *Anders. P. A. S. B.* 1871, p. 186.
Eumeces blythianus, *Theob. Cat.* p. 66; *Bouleng. Cat. Liz.* iii, p. 385.

This species, of which I have not seen examples, appears to be very closely allied to the preceding. It has 30 scales round the body, and the auricular lobules are strong. It also differs in the presence of a single postmental. Olive-brown above; three dark brown longitudinal lines along the back, from the nape to the base of the tail; a broader dark brown band from the eye over the tympanum, along the side; a broad pale yellowish band below it from below the eye to the groin; lower surfaces yellowish.

From snout to vent 3·5 inches; tail 6.

Hab. Amritsar, Punjab? (the locality is doubtful, and the species may not be Indian).

Genus SCINCUS,

Laurenti, Syn. Rept. p. 55, 1768.

Palatine bones not meeting on the median line of the palate; pterygoids toothed. Lateral teeth conical or with obtuse tubercular crowns. Eyelids well developed, scaly. Ear hidden or partly concealed under an opercle. Nostril pierced between an upper and a lower nasal; supranasals present; præfrontals, frontoparietals, and interparietal distinct. Limbs well developed, pentadactyle; digits flattened, serrated laterally, with transverse lamellæ beneath.

This genus is restricted to the sandy deserts of North Africa and South-western Asia, from the Sahara to Sind. Of the 8 species one is peculiar to the last-named province.

258. Scincus arenarius.

Scincus arenarius, *Murray, Zool. Sind,* p. 353, pl.—, fig. 2; *Bouleng. Cat. Liz.* iii, p. 392.

Snout depressed, cuneiform, truncated, strongly projecting; loreal region concave; mouth inferior; eye small; ear hidden. Rostral very large, forming a suture with the frontonasal; 6 supraoculars, second, third, and fourth in contact with the frontal; parietals shorter than the interparietal, followed by 2 to 4 pairs of nuchals; 8 or 9 upper labials. Scales perfectly smooth, laterals smallest, dorsals not quite so large as ventrals; 28 or 30 round the middle of the body. Sides of belly and neck angular. Digits short, much depressed and strongly toothed laterally. Cream-coloured, each dorsal scale with one or two buff streaks or dots; 7 to 10 deep reddish-brown vertical blotches on each side.

From snout to vent 4 inches; tail 2.

Hab. Sind (Hab plains).

Genus **OPHIOMORUS**,

Dum. & Bibr. Erp. Gén. v, p. 799, 1839.

Palatine bones not meeting on the median line of the palate, which is toothless. Teeth conical or with obtuse crowns. Eye small; lower eyelid with an undivided transparent disk. Ear hidden or hardly distinguishable. Nostril pierced in the suture

Fig. 59.—Upper and side views of head of *Ophiomorus tridactylus.*

between a nasal and a supranasal; præfrontals very small or absent; frontoparietals small, distinct from interparietal. Body much elongate; limbs rudimentary or absent.

Distribution. Greece; South-western Asia, from Asia Minor and Syria to North-western India. 6 species are known.

Synopsis of Indian Species.

Fingers and toes three . . . . *O. tridactylus*, p. 222.
Fingers four, toes three . . . . *O. blanfordii*, p. 222.

259. Ophiomorus tridactylus.

Sphenocephalus tridactylus, *Blyth, J. A. S. B.* xxii, 1855, p. 654; *Günth. Rept. B. I.* p. 98; *Theob. Cat.* p. 70; *Blanf. Zool. E. Persia*, p. 395; *Murray, Zool. Sind*, p. 356.
Ophiomorus tridactylus, *Bouleng. Cat. Liz.* iii, p. 394.

Snout wedge-shaped, with angularly projecting labial edge; mouth inferior. Nostril close to the rostral, which is large and nearly reaches the posterior border of the supranasals; a small anterior and a larger second loreal, the latter usually coalesced with the præfrontal on each side; frontonasal rather large, one half or two thirds the length of the frontal; latter as broad as long or slightly broader; 3 or 4 very small supraoculars; no supraciliaries; a præocular; interparietal as long as broad, as long as the frontal or slightly shorter; frontoparietals small; parietals band-like, narrow; a pair of nuchals, in contact with the interparietal; first and second upper labials smallest, in contact with the nasal, fifth much larger than the four anterior together. Ear hidden. Two azygos postmentals. Body much elongate, with angular latero-ventral edge, with two pairs of short tridactyle limbs; the posterior limbs proportionately much more developed than the anterior, and a little longer than the distance between the fore limb and the anterior corner of the eye. 22 scales round the body, those of the back and of the two median ventral series narrower than the others. Two slightly enlarged præanals. Tail shorter than head and body, cyclotetragonal at the base, compressed and pointed at the end. Cream-coloured, uniform or with longitudinal series of brown dots on the back; a more or less distinct brown streak passing through the eye.

From snout to vent 3·75 inches; tail 2·2.

Hab. Punjab, Sind, Cutch, Afghanistan, Eastern Persia. Burrows in the sand.

260. Ophiomorus blanfordii.

Zygnidopsis brevipes (*non Blanf.* 1874), *Blanf. J. A. S. B.* xlviii, 1879, p. 128.
Ophiomorus blanfordii, *Bouleng. Cat. Liz.* iii, p. 395, pl. xxxiii, fig. 1.

Snout wedge-shaped, with angularly projecting labial edge. Nostril close to the rostral; supranasals forming a long suture; two loreals, first largest and in contact with the third and fourth upper labials; frontonasal moderate, not half as long as the frontal; præfrontals longer than broad, widely separated; frontal slightly longer than broad; four supraoculars, first and second in contact with the præfrontal; two supraciliaries, behind the first supra-ocular; frontoparietals much smaller than præfrontals; interparietal as long as broad, a little shorter than the frontal; parietals narrow, band-like; no nuchals; first and second labials in contact with the nasal, fifth largest, fifth and sixth below the eye. Ear hidden. Two azygos postmentals. Body much elongate, with angular latero-

ventral edge, with two pairs of short limbs, the anterior tetradactyle, the posterior tridactyle; the hind limb proportionally more developed than the anterior, a little longer than the distance between the fore limb and the anterior corner of the eye, and contained $3\frac{2}{3}$ times in the distance from the fore limb. 20 scales round the body, subequal. Two enlarged præanals. Tail a little shorter than head and body, ending in a point. Cream-coloured, each dorsal scale with a central brown dot; the dots form two lines on the middle of the back and a dark band on each side, beginning from the nostril and passing through the eye; the two vertebral lines unite into a streak on the middle of the head.

From snout to vent 3 inches; tail 2·8.

Hab. Southern coast of Persia or Baluchistan? The exact locality uncertain.

Genus CHALCIDES,

Laurenti, Syn. Rept. p. 64, 1768.

Palatine bones not meeting on the median line of the palate, which is toothless. Teeth conical or with obtuse crowns. Lower eyelid with an undivided transparent disk. Ear more or less distinct. Nostril pierced between the rostral and a very small nasal

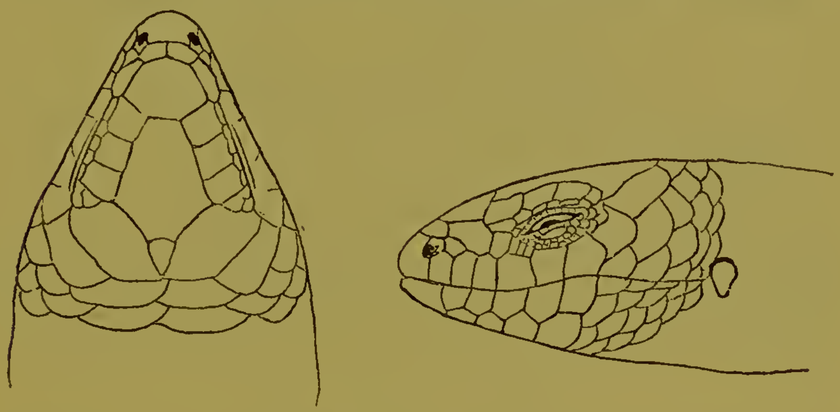

Fig. 60.—Upper and side views of head of *Chalcides ocellatus.*

in an emargination of the former shield; supranasals present; præfrontals and frontoparietals absent. Body much elongate; limbs short or rudimentary.

Distribution. South Europe; Africa north of the equator; South-western Asia, from Syria and Arabia to Sind. 11 species are known.

Synopsis of Indian Species.

Ear-opening present, limbs moderate ...... *C. ocellatus*, p. 224.
No ear-opening, limbs very small .... *C. pentadactylus*, p. 224.

261. Chalcides ocellatus.

Lacerta ocellata, *Forsk. Hist. Anim.* p. 13.
Seps (Gongylus) ocellatus, *Blanf. Zool. E. Pers.* p. 395; *Murr. Zool. Sind*, p. 357.
Chalcides ocellatus, *Bouleng. Cat. Liz.* iii, p. 400.

Snout obtuse, scarcely projecting beyond the labial margin; eyes moderate; ear-opening much larger than the nostril, subtriangular or subquadrangular. Nostril pierced just above the suture between the rostral and the first labial; a postnasal, in contact with the first and second labials; supranasals distinct; frontal longer than broad; usually the fifth labial entering the orbit. Sides of belly rounded. Scales smooth or feebly striated, 28 to 34 (to 40 in specimens from Morocco) round the middle of the body. Limbs short but well developed and pentadactyle; the length of the hind limb is usually less than the distance from the end of the snout to the fore limb, and enters $3\frac{1}{3}$ to $4\frac{1}{2}$ times in the length from snout to vent. Tail shorter than head and body. Olive or brown above, with black spots, each bearing a central white dot or longitudinal shaft; lower parts white.

From snout to vent $5\frac{1}{2}$ inches; tail 4.

Hab. North and North-east Africa, islands of the Mediterranean, Syria, Arabia, Persia. Recorded from Sind by Murray.

262. Chalcides pentadactylus.

Sphenocephalus? pentadactylus, *Beddome, Madras Journ. Med. Sc.* 1870, pl. i.

The description and figure published by Beddome, from a single specimen preserved in the Madras Museum, indicate a Lizard closely allied to the North-African, Arabian, and Syrian *C. sepoides*, Audouin, with which it is possibly identical. The original description is as follows, the names in square brackets being added by me:—

"The anterior legs minute and fitting into a groove; fingers five, the third slightly longer than the fourth, first and fifth very small; posterior legs well formed; toes five, the fourth longer than the third, the fifth very small; form slender, four and a quarter inches long, as thick as a goose-quill, two thirds cylindrical, flat, and laterally angled beneath as far as the vent; the body and tail covered with small smooth lustrous hexagonal scales, with a median row of broader subcaudals; upper lip covering the mouth; eyes minute, surrounded by small scales; no external trace of ears; nostrils in small single shields let into the posterior side of the rostral, with a small postnasal behind each, and two large shields in the loreal region behind the postnasal and the eye; rostral square behind, a single præfrontal narrow and a parallelogram in shape [the united supranasals]; postfrontal [præfrontal] single, six-sided; vertical [frontal] broader behind; occipitals [parietals]

rounded behind, with a small shield [interparietal] between them, which is let into the posterior base of the vertical; five plates (some divided) over the eye, and between it and the vertical and postfrontal; upper labials 8–9, the fourth and fifth below the eye, some large shields over the posterior ones; the distance between the axils of the fore and hind limbs is a little more than $1\frac{3}{4}$ inch; colour of a uniform dark brown; hind limbs a little more than half an inch long; fore limbs very slender, and not quite a quarter inch long."

Hab. On the sandy banks of the Kuddle Poondy, a tidal river near Beypore.

Genus SEPOPHIS,

Beddome, Madras Journ. Med. Sc. 1870.

Palatine bones not meeting on the median line of the palate, which is toothless. Teeth conical. Eye small; lower eyelid scaly.

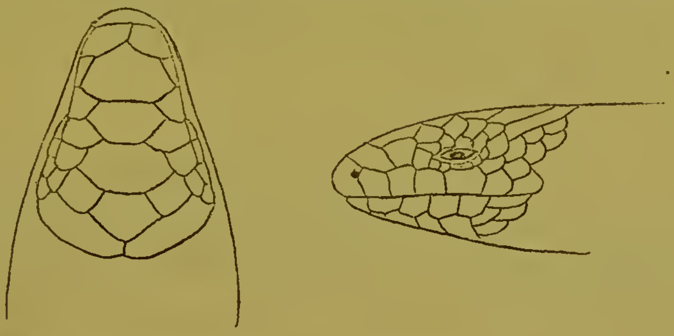

Fig. 61.—Upper and side views of head of *Sepophis punctatus*.

Ear-opening distinct, minute. Nostril pierced between the rostral, the first labial, and a supranasal; two frontals; no præfrontals; frontoparietals present. Body much elongate; limbs absent.

A single species.

263. Sepophis punctatus.

Russell, Ind. Serp. i, pl. xlii.
Sepsophis punctatus, *Bedd. Madras Journ. Med. Sci.* 1870; *Bouleng. Cat. Liz.* iii, p. 423, pl. xxxvii, fig. 2.

Snout obtuse, scarcely projecting beyond the labial margin; supranasals forming a median suture and in contact with the first and second upper labials; 4 azygos shields on the upper surface of the head, first 3 broader than long, first (the frontonasal) largest, second a little smaller than third, fourth smallest; 4 supraoculars, first and second in contact with the first frontal; 6 supraciliaries; frontoparietals separated; parietals narrow; fourth upper labial entering the orbit. 20 scales round the middle of the body. Præanals scarcely enlarged. A bud-like rudiment of the fore limb externally. Tail as long as head and body. Cream-coloured;

sides blackish brown; two series of dark brown spots or dots along the back.

From snout to vent 4·25 inches.

Hab. Golgonda Hills, near Vizagapatam, 3000 feet, and Gorge Hills, Godávari, 2000 feet.

Genus CHALCIDOSEPS,

Boulenger, Cat. Liz. iii, p. 423, 1887.

Palatine bones not meeting on the median line of the palate, which is toothless. Teeth conical. Eye small; lower eyelid scaly. Ear-opening distinct, minute. Nostril pierced in the rostral, close

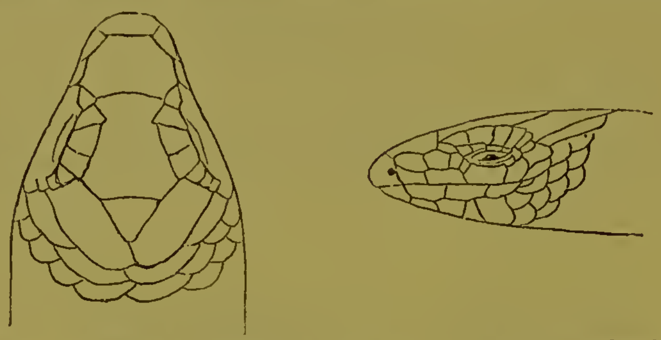

Fig. 62.—Upper and side views of head of *Chalcidoseps thwaitesii.*

to the posterior border; no supranasals; præfrontals and fronto-parietals absent. Body much elongate; limbs very short, tetradactyle.

Distribution. Ceylon.

264. Chalcidoseps thwaitesii.

Nessia thwaitesii, *Günth. A. M. N. H.* (4) ix, 1872, p. 86; *Theob. Cat.* p. 68.

Chalcidoseps thwaitesii, *Bouleng. Cat. Liz.* iii, p. 423, pl. xxxviii, fig. 1.

Snout obtuse, scarcely projecting beyond the labial margin; frontonasal broader than long, broader than the frontal and about half as long; the latter longer than broad, angularly emarginate on each side by the first supraocular; 5 supraoculars; 7 supraciliaries; interparietal triangular, narrower than the frontal and half as long; parietals forming a suture behind the interparietal; a pair of nuchals and a pair of temporals broader the parietals; second upper labial largest, third entering the orbit. 24 scales round the middle of the body. Præanals not enlarged. Digits very short. Tail half as long as head and body. Brown above, yellowish below, each scale with darker centre.

From snout to vent 2·6 inches; tail 1·3.

Hab. Ceylon.

Genus ACONTIAS,

Cuvier, Règne An. ii, p. 60, 1817.

Palatine bones not meeting on the median line of the palate,

which is toothless. Teeth conical. Eye small, with transparent lower eyelid; upper eyelid not developed. Ear hidden or just distinguishable. Nostril pierced in the large rostral shield, with the

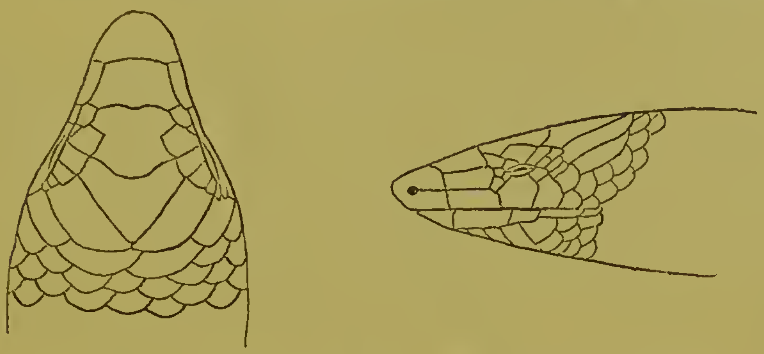

Fig. 63.—Upper and side views of head of *Acontias layardii.*

posterior border of which it is connected by a long straight horizontal suture; no supranasals; no præfrontals or frontoparietals. Body much elongate; limbs rudimentary or absent.

Distribution. South Africa, Madagascar, Ceylon. 9 species are known.

Synopsis of Ceylonese Species.

A. Interparietal broader than the frontal.
  a. Limbs present, tridactyle .... *A. burtonii*, p. 227.
  b. Limbs present, bud-like .... *A. monodactylus*, p. 228.
  c. Limbs absent...................... *A. layardii*, p. 228.
B. Interparietal narrower than the frontal; bud-like rudiments of hind limbs ...... *A. sarasinorum*, p. 228.

265. Acontias burtonii.

Nessia burtonii, *Gray, Ann. N. H.* ii, 1839, p. 336; *Kelaart, Prodr.* ii, p. 11; *Günth. Rept. B. I.* p. 97: *Theob. Cat.* p. 68.
Acontias burtonii, *Bouleng. Cat. Liz.* iii, p. 425.

Head conical; snout long, pointed, projecting; ear-opening distinct, minute; rostral covering about one-third of the snout; mental moderate; frontonasal longer than the rostral and slightly shorter than the frontal; the latter shield about as broad as long, angularly emarginate on each side by the first supraocular; 4 supraoculars; 6 supraciliaries; interparietal nearly as long as the frontal and a little broader; parietals narrow; loreal and first upper labial very long, much longer than the rostral; second labial entering the orbit. 24 scales round the middle of the body, equal. Both pairs of limbs present, minute, tridactyle, clawed. Præanal scales not or scarcely enlarged. Length of the tail contained about $1\frac{1}{2}$ times in that of the head and body. Brown, lighter beneath, each scale edged with darker.

From snout to vent 3 inches; tail 1·8.

Hab. Ceylon.

266. Acontias monodactylus.

Evesia monodactylus, *Gray, Ann. N. H.* ii, 1839, p. 336.
Nessia monodactyla, *Günth. Rept. B. I.* p. 97; *Theob. Cat.* p. 68.
Acontias monodactylus, *Bouleng. Cat. Liz.* iii, p. 425.

Snout shorter than in the preceding, more obtuse; ear-opening distinct, minute; rostral covering nearly half the snout; mental moderate; frontonasal a little shorter than the rostral, shorter than the frontal; the latter shield as long as broad or a little broader than long, angularly emarginate on each side by the first supra-ocular; 3 supraoculars; 6 supraciliaries; interparietal nearly as long as the frontal and a little broader; parietals narrow: loreal and first upper labial scarcely longer than the rostral; second labial entering the orbit. 24 scales round the middle of the body, equal. Both pairs of limbs represented by undivided, bud-like rudiments. Præanal scales not enlarged. Length of tail one-third of the total. Brown, lighter beneath, each scale edged with darker.

From snout to vent 3·5 inches; tail 1·6.

Hab. Ceylon.

267. Acontias layardii.

Acontias layardi, *Kelaart, Prodr.* ii, p. 12; *Günth. Rept. B. I.* p. 96; *Theob. Cat.* p. 67; *Bouleng. Cat. Liz.* iii, p. 426.

Head conical; snout acuminate, projecting; ear hidden; rostral covering not quite half the snout; mental moderate; frontonasal as long as the rostral, slightly shorter than the frontal; the latter shield about as broad as long, angularly emarginate on each side by the first supraocular; 3 supraoculars; 6 supraciliaries; inter-parietal nearly as long as the frontal and a little broader; parietals narrow; loreal and first labial a little longer than the rostral; second labial entering the orbit. 22 scales round the middle of the body, equal. Limbs absent. Præanal scales not enlarged. Length of tail about one-third of the total. Brown, each scale edged with darker.

From snout to vent 3 inches; tail 1·3.

Hab. Ceylon.

268. Acontias sarasinorum.

Acontias sarasinorum, *F. Müller, Verh. Nat. Ges. Basel,* viii, 1889, p. 702, pl. x.

Head conical; snout obtuse, prominent; ear-opening distinct, but very minute; rostral covering not quite half the snout; mental moderate; frontonasal shorter than the rostral or the frontal; the latter shield a little broader than long, angularly emarginate on each side by the first supraocular; 4 supraoculars; interparietal triangular, equilateral, much narrower than the frontal; parietals narrow; 2 loreals, together as long as the first labial, which is shorter than the rostral; second and third labials entering the orbit. 24 (22 ?) scales round the middle of the body. Bud-like rudiments of hind limbs. Præanal scales not enlarged. Length of tail about one-third of the total. Pale brown, each scale edged with darker.

Total length 5·5 inches; tail 1·9.

Hab. Ceylon. I have not seen this newly described *Acontias*.

Family VIII. DIBAMIDÆ.

Tongue short, bifid posteriorly, pointed, undivided in front, covered with curved lamellæ or plicæ. Teeth small, pointed, hooked, none on palate. Skull compact; no interorbital septum; no columella cranii; no arches; no infraorbital foramen; præmaxillary double. Fore limbs absent; the hind pair represented, in the male, by a pair of flaps on the sides of the anal opening; no rudiments of the sternal apparatus. Body vermiform, covered with cycloid imbricate scales. No osteodermal plates. Eyes concealed under the skin. No ear-opening. No præanal pores.

A single genus and a single species, ranging from the Nicobars to New Guinea.

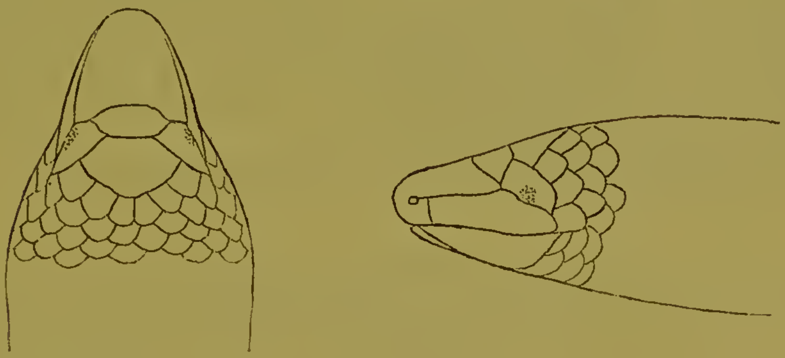

Fig. 64.—Upper and side views of head of *Dibamus novæ-guineæ.*

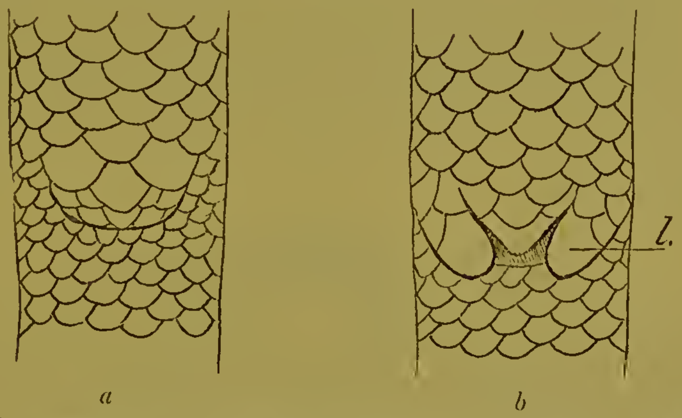

Fig. 65.—Anal region of *Dibamus novæ-guineæ.* *a.* Female. *b.* Male. *l.* Rudimentary limbs.

Genus DIBAMUS,

Dum. & Bibr. Erp. Gén. v, p. 833, 1839.

Snout normally covered by three large shields, viz. the rostral, and a labial on each side, which, however, may fuse into a single

shield. Nostril pierced in the rostral, with a straight horizontal suture behind it. Limbs totally absent in the female, the hind pair represented in the male by two flap-like rudiments.

269. Dibamus novæ-guineæ.

Dibamus novæ-guineæ, *Dum. & Bibr. Erp. Gén.* v, p. 834; *Bouleng. Cat. Liz.* iii, p. 435.
Rhinophidion nicobaricum, *Steindachn. Novara, Rept.* p. 53.
Typhloscincus nicobaricus, *Steind. l. c.* p. 94, pl. iii, figs. 6–8.
Dibamus nicobaricus, *Stoliczka, J. A. S. B.* xlii, 1873, p. 168; *Theob. Cat.* p. 69; *Bouleng. l. c.*

Snout conical, obtuse, slightly projecting. 4 enlarged shields on the head besides the rostral and labials, viz. a frontal, an interparietal, and an ocular on each side; interparietal shield largest; eye scarcely distinguishable through the ocular; a narrow, elongate, trapezoidal mental; a very large sublabial on each side. Scales equal, 22 to 26 round the middle of the body. Præanal scales very small. Tail very short, obtuse. Uniform purplish-brown.

Total length 6·5 inches.

Hab. Nicobars, Sumatra, Celebes, Moluccas, New Guinea.

Suborder II. *RHIPTOGLOSSA.*

External nasal openings bounded by the maxillary and the præfrontal, the nasal bones being excluded from their border; vomer single; pterygoids not reaching quadrate. No clavicles or interclavicle, though the limbs are well developed. Digits united in two bundles, forming a grasping organ. Tongue cylindrical, extremely extensile and projectile, sheathed at the base, club-shaped and viscose at the end, with an exceedingly elongate glossohyal bone.

A single family.

Family I. CHAMÆLEONTIDÆ.

The head usually forms a bony casque, ornamented with crests or tubercles. The interorbital septum is present. Præmaxillary extremely small, edentulous; orbit bony all round, the præ- and postfrontals often joining to form a supraorbital roof; a pair of supranasal fontanelles, bordered by the nasals, the præfrontals, and the frontal; the latter bone single; "parietal" foramen, if present, pierced in the frontal; parietal single, often much narrowed and compressed, forming a crest, and meeting posteriorly the extremities of the squamosals. In some species the parietals in the adult are much expanded and form a bony slab. Dentition acrodont; teeth

compressed, triangular, more or less distinctly tricuspid. Palate toothless. Eye large, covered by a thick granular lid pierced with a small central opening for the pupil. No tympanum. Body compressed; neck very short. Vertebræ procœlian. Abdominal ribs present. Limbs long, raising the body. Digits arranged in

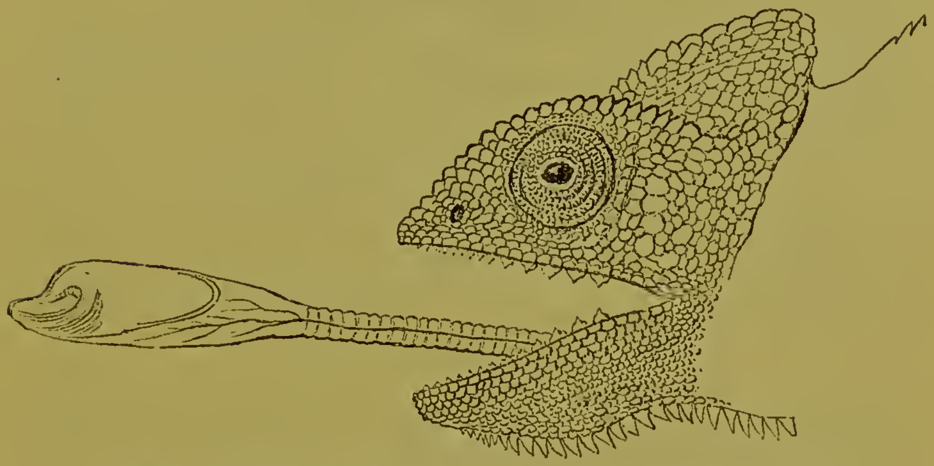

Fig. 66.—Head of *Chamæleon calcaratus*, with projected tongue.

bundles of 2 and 3; in the hand, the inner bundle is formed of three, the outer of two digits; it is the reverse in the foot. Tail prehensile. Head and body covered with granules or tubercles.

Fig. 67.—Hand of *Chamæleon calcaratus*.

Physiologically as well as anatomically, Chameleons stand by themselves among Reptiles, as is evidenced by the mobility and independent action of their eyes, the projectility of their tongue, the slow and deliberate movements of their limbs. The changeable hue of the skin, first noticed in them, is a peculiarity shared by many other lizards, and especially by *Calotes*.

Some 55 species are known, arranged in three genera. About half of the species occur in Madagascar and neighbouring islands, the other half chiefly in Africa; the common Chameleon is Mediterranean; a species inhabits Socotra, another South Arabia, and a third India and Ceylon.

Genus CHAMÆLEON,

Laurenti, Syn. Rept. p. 45, 1768.

Claws simple; scales on soles smooth. Tail at least as long as the body.

270. Chamæleon calcaratus.

Chamæleon calcaratus, *Merrem, Tent.* p. 162; *Bouleng. Cat. Liz.* iii, p. 445, pl. xxxix, fig. 2.
Chamæleon zeylonicus (*non Laur.*), *Jerdon, J. A. S. B.* xxii, 1853, p. 466.
Chamæleon vulgaris (*non Daud.*), *Günth. Rept. B. I.* p. 162; *Theob. Cat.* p. 120.

Casque much elevated posteriorly, with strong curved parietal crest; the distance between the commissure of the mouth and the extremity of the casque equals or nearly equals the distance between the end of the snout and the hinder extremity of the mandible; no rostral appendages; a strong lateral crest, not reaching the end of the parietal crest; an indication of a dermal occipital lobe on each side, not reaching the parietal crest. No enlarged tubercles on the body; a feebly serrated dorsal crest; a series of conical tubercles form a very distinct crest along the throat and belly. Male with a tarsal process or spur. Tail longer than head and body. Gular-ventral crest white; commissure of the mouth white.

From snout to vent 7 inches; tail 8.

Hab. Wooded districts of Peninsular India south of the Gangetic plain, and Ceylon.

Suborder III. *OPHIDIA.*

The most characteristic peculiarity of Ophidians as compared to Lacertians is the absence of solid union between the rami of the mandible, the two halves being connected in front by an elastic ligament; a structure which allows the animal to dilate its mouth and swallow a prey larger than the buccal orifice would otherwise admit. In most Snakes (*Boidæ*, *Colubridæ*, *Viperidæ*), the bones of the upper jaw and of the palate are likewise mobile, thus allowing a dilatation of the gape to an extraordinary degree. There are no movable eyelids: the lid extends as a transparent disk over the eyeball, and its outer layer is cast off periodically in a

single piece with the rest of the epidermis. No Snakes have an ear-opening. The tongue is smooth, bifid, and retractile into a basal sheath. Limbs are absent, and the animal moves by lateral undulations.

The primary division of Ophidians into poisonous and non-poisonous must be regarded as unscientific; and, although adopted almost generally, it is in so far incorrect that a number of forms (*Opisthoglypha*) usually ranked as harmless are really poisonous, although their bite may be without effect on man and large animals. Experiments recently made on *Cœlopeltis*, a genus allied to *Psammophis* *, and *Dryophis* †, have shown that these snakes are poisonous, and that they paralyze their small prey before deglutition. It is probable that all Snakes with grooved teeth will prove to be poisonous, to a greater or less degree, as it is clear, *à priori*, that these grooved fangs are not without a function. I have therefore abandoned this physiological character in dividing the Snakes into families. Poisonous as well as harmless forms are arranged under *Colubridæ*. All *Viperidæ* are poisonous.

The poison-gland is situated on each side above the upper jaw, below and behind the eye, and in some Elapoid forms even extends far back along each side of the body. This gland communicates by a duct with the poison-fangs, which are enlarged, channelled or "perforated" teeth. The difference between channelled and perforated fangs is but one of degree, and the term "perforated" is anatomically incorrect. In both these types, the structure of the teeth is essentially the same; they are folded over so as to form a duct to carry the poisonous secretion; when the edges meet and coalesce, a perforated fang is formed, when they merely approach each other, the channelled form results.

A general desire is felt by those not well acquainted with Snakes to be able to distinguish at a glance between harmless and poisonous forms. To meet this requirement, various criteria have been proposed by authors, none of which, however, are satisfactory. It is well to state at once that there is no sure method of distinguishing the two kinds by external characters; except, of course, by a knowledge of the various forms. And even then, a cursory examination is not always sufficient, since there is, in some cases, a striking resemblance between Snakes of totally different affinities, by which even specialists may be at first deceived. In short, nothing but an examination of the dentition can afford positive information as to the poisonous or non-poisonous nature of an unknown Snake.

About 1500 species of Snakes are known. They may be arranged in nine families, all represented in India, and defined in the following synopsis.

* Peracca & Deregibus, Arch. Ital. Biol. v, 1884, p. 108.
† Vaillant, Mém. Cent. Soc. Philom. 1888, p. 44.

Synopsis of the Families.

A. No transpalatine; pterygoids not extending to quadrate or mandible; no supratemporal; præfrontals forming a suture with nasals; coronoid present; vestiges of pelvic arch.

- *a.* Maxillary vertical, loosely attached, toothed; mandible edentulous; a single pelvic bone .... 1. **Typhlopidæ**, p. 234.
- *b.* Maxillary bordering mouth, forming a suture with præmaxillary, præfrontal, and frontal, toothless; lower jaw toothed; pubis and ischium present, latter forming a symphysis . 2. **Glauconiidæ**, p. 242.

B. Transpalatine present; both jaws toothed.

- *a.* Coronoid present; præfrontals forming a suture with nasals.
    - *a'.* Vestiges of hind limbs; supratemporal present.
        - *a''.* Supratemporal large, suspending the quadrate .... 3. **Boidæ**, p. 244.
        - *b''.* Supratemporal small, intercalated in the cranial wall .... 4. **Ilysiidæ**, p. 249.
    - *b'.* No vestiges of limbs; supratemporal absent .... 5. **Uropeltidæ**, p. 251.
- *b.* Coronoid absent; supratemporal present, suspending the quadrate.
    - *a'.* Maxillary horizontal; pterygoids reaching quadrate or mandible.
        - *a''.* Præfrontal bones forming a suture with nasals .... 6. **Xenopeltidæ**, p. 275.
        - *b''.* Præfrontals not forming a suture with nasals .... 7. **Colubridæ**, p. 277.
    - *b'.* Maxillary horizontal, converging posteriorly toward palatines; pterygoids not reaching quadrate or mandible .... 8. **Amblycephalidæ**, [p. 414.
    - *c'.* Maxillary vertically erectile, perpendicular to transpalatine; pterygoids reaching quadrate or mandible .... 9. **Viperidæ**, p. 417.

Family I. TYPHLOPIDÆ.

Cranial bones solidly united; no transpalatine; pterygoids not extending to mandible; no supratemporal; præfrontals forming a suture with nasals; maxillary vertical, loosely attached, with a few teeth; no teeth on palate. Mandible edentulous; coronoid bone present. Vestiges of pelvis, reduced to a single bone on each side. Body covered with uniform cycloid scales; eyes under the shields.

Small worm-like Snakes leading a subterranean life. The number of species known is very great, nearly a hundred, constituting four

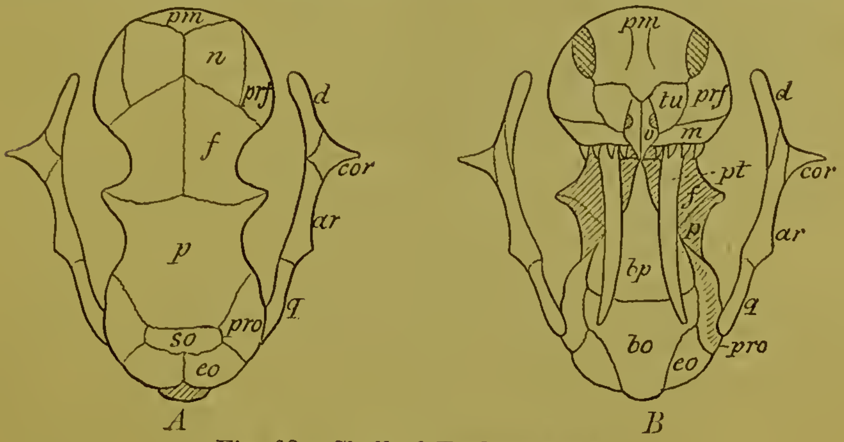

Fig. 68.—Skull of *Typhlops diardi*.
A. Upper view. *B*. Lower view.

ar. Articular.	*f*. Frontal.	*pro*. Prootic.
bo. Basioccipital.	*m*. Maxillary.	*pt*. Pterygoid.
bp. Basisphenoid.	*n*. Nasal.	*q*. Quadrate.
cor. Coronoid.	*p*. Parietal.	*so*. Supraoccipital.
d. Dentary.	*pm*. Præmaxillary.	*tu*. Turbinal.
eo. Exoccipital.	*prf*. Præfrontal.	*v*. Vomer.

genera, of which but one is represented in India and its dependencies. They are found all over the hotter parts of the globe. Oviparous; eggs very large, elongate, few in number.

Fig. 69.—Head of *Typhlops braminus*.
A. Upper view. *B*. Side view.
To illustrate the nomenclature of the shields.

f. Frontal.	*o*. Ocular.	*prf*. Præfrontal.
ip. Interparietal.	*p*. Parietal.	*r*. Rostral.
l. Labial.	*po*. Præocular.	*so*. Supraocular.
n. Nasal.		

Genus TYPHLOPS,

Schneider, Hist. Amph. ii, p. 339, 1801.

Head with large shields; nostril in a single or divided nasal. Tail extremely short.

Distribution. Southern Asia, borders of the Mediterranean, Africa, Australia, Central and South America, and West Indies. 13 species are known from India and its dependencies.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Snout rounded; nostrils lateral.
  a. No subocular, ocular in contact with 3rd and 4th labials.
    a'. Nasal completely divided into two.
      a''. 18 or 20 scales round body.
        α. Anterior nasal in contact with præocular; posterior nasal separated from its fellow by præfrontal.......... *T. braminus*, p. 236.
        β. Anterior nasal separated from præocular by posterior nasal, which forms a suture with its fellow on upper surface of head. *T. beddomii*, p. 237.
      b''. 22 scales round body.
        α. Upper part of rostral about 1/3 width of head .... *T. leucomelas*, p. 237.
        β. Upper part of rostral hardly 1/4 width of head .... *T. jerdoni*, p. 238.
    b'. Nasal nearly completely divided; 24 or 26 scales round body.
      a''. No pits under snout.
        α. Upper part of rostral hardly 1/4 width of head .... *T. oatesii*, p. 238.
        β. Upper part of rostral about 1/3 width of head .... *T. diardi*, p. 238.
      b''. A pair of pits under snout ...... *T. bothriorhynchus*, p. 239.
    c'. Nasal semidivided.
        α. 18 scales round body.......... *T. porrectus*, p. 240.
        β. 22 scales round body; tail more than twice as long as broad .... *T. theobaldianus*, p. 240.
  b. A subocular, separating ocular from 3rd labial; nasal completely divided; 18 scales round body.
    a'. Ocular in contact with 4th labial .. *T. mirus*, p. 240.
    b'. Ocular separated from labials by 2 suboculars...................... *T. andamanensis*, p. 241.
B. Snout rounded; nostrils inferior; nasal semidivided; 22 scales round body .... *T. tenuicollis*, p. 241.
C. Snout pointed and hooked, with sharp horizontal edge and inferior nostrils; latter touching rostral; 28 to 36 scales round body .... *T. acutus*, p. 241.

271. Typhlops braminus.

Russell, Ind. Serp. i, pl. xliii.
Eryx braminus, *Daud. Rept.* vii, p. 279.
Typhlops braminus, *Cuv. Règne. An.* 2nd ed. ii, p. 73; *Dum. & Bibr. Erp. Gén.* vi, p. 309; *Cantor, J. A. S. B.* xvi, 1847, p. 899; *Jan, Icon. Ophid.* p. 12, l. 3, pls. iv & v, fig. 16; *Günth. Rept. B. I.* p. 175, pl. xvi, fig. I; *Blanf. J. A. S. B.* xxxix, 1870, p. 370; *Stoliczka, J. A. S. B.* xl, 1871, p. 425; *Theob. Cat.* p. 125; *Murray, Zool. Sind*, p. 374.
Typhlops tenuis (*non Salv.*), *Günth. Rept. B. I.* p. 176, pl. xvi, fig. C.
Typhlops pammeces, *Günth. op. cit.* p. 444; *Theob. Cat.* p. 125.

Snout round and moderately projecting; nostrils lateral. Rostral narrow, its upper portion hardly one third the width of the head, not extending quite to the level of the eyes; nostril between two nasals, the anterior (or lower) of which is in contact with the præocular; the latter shield nearly as large as the ocular; eye distinct; præfrontal, frontal, supraoculars, and parietals a little larger than the scales on the body; præfrontal in contact with the rostral; 4 upper labials. Diameter of body 35 to 55 times in the total length; tail a little longer than broad, ending in a spine. 20 scales round the body. Brown or blackish above, lighter beneath; snout, anal region, and end of tail usually whitish.

Total length 7 inches.

Hab. This is the commonest species, distributed all over India and its dependencies. Its range extends to Southern China, the Malay Peninsula and Archipelago, Arabia, Africa south of the Equator, Madagascar, and the Islands of the Indian Ocean. Found occasionally in large numbers in decayed wood.

272. Typhlops beddomii.

Snout rounded and moderately prominent; nostrils lateral. Rostral narrow, its upper portion hardly one third the width of the head, not extending to the level of the eyes; nostril between two nasals, the anterior (or lower) of which is in contact with the first and second labials, the upper forming a suture behind the rostral; a præocular, nearly as large as the ocular; eye distinct; upper head-shields a little larger than the scales on the body; 4 upper labials. Diameter of body 20 to 40 times in the total length; tail a little longer than broad, not ending in a spine, the terminal scale obtusely conical. 18 scales round the body. Brown above, lighter beneath; usually a more or less distinct darker vertebral line; end of snout and chin, and anal region, whitish.

Total length 5 inches.

Hab. This species has a rather wide distribution in the hills of the Indian Peninsula, Col. Beddome having collected specimens in the Kimedy Hills (Vizagapatam district) and in the Anaimalai and Travancore Hills, between 2000 and 5000 feet

273. Typhlops leucomelas.

Snout rounded and moderately projecting; nostrils lateral. Rostral narrow, its upper portion about one third the width of the head, extending to between the eyes; nostril between two nasals, the anterior of which is in contact with the first and second labials and extends to the upper surface of the head; a præocular, nearly as large as the ocular; eye distinct; upper head-scales a little larger than the scales on the body; 4 upper labials. Diameter of body 32 times in the total length; tail slightly longer than broad, ending in a point. 22 scales round the body. Blackish brown above, pure white beneath.

Total length 5 inches.

Hab. A single specimen was found by Col. Beddome on the Haycock Mountain (2000 ft.) in Ceylon, 40 miles from Point de Galle.

274. Typhlops jerdoni.

Snout rounded and moderately projecting; nostrils lateral. Rostral very narrow, its upper portion hardly one fourth the width of the head, extending to the level of the eyes; nostril between two nasals, the anterior of which is in contact with the first and second labials and extends to the upper surface of the head; a præocular, nearly as large as the ocular; eye distinct; supraoculars and parietals much larger than the scales on the body; 4 upper labials. Diameter of body 37 to 46 times in the total length; tail a little longer than broad, ending in a spine. 22 scales round the body. Brown above, lighter beneath; end of snout, anal region, and lower surface of tail whitish.

Total length 9 inches.

Hab. Three specimens were obtained in the Khási Hills and presented to the British Museum by the late Mr. T. C. Jerdon.

275. Typhlops oatesii.

Snout rounded and moderately projecting; nostrils lateral. Rostral very narrow, its upper portion hardly one fourth the width of the head, extending to the level of the eyes; nasal nearly completely divided, the cleft proceeding from the second labial; a præocular, a little smaller than the ocular; eye distinct; upper head-scales a little larger than the scales on the body; 4 upper labials. Diameter of body 31 to 33 times in the total length; tail as long as broad or broader than long, ending in a spine. 24 scales round the body. Yellowish, with confluent brown spots corresponding to the series of scales and forming longitudinal lines which are broader than the interspaces.

Total length 8 inches.

Hab. Three specimens, from Table Island, Cocos group, were presented to the British Museum by Mr. E. W. Oates.

276. Typhlops diardi.

Typhlops diardi, *Schleg. Abbild.* p. 39; *Dum. & Bibr. Erp. Gén.* vi, p. 300; *Jan, Icon. Ophid.* p. 19, l. 3, pls. iv, v, fig. 10.
Argyrophis horsfieldii, *Gray, Cat. Liz.* p. 137.
Typhlops striolatus, *Peters, MB. Ak. Berl.* 1861, p. 922; *Günth. Rept. B. I.* p. 174; *Theob. Cat.* p. 122.
Typhlops horsfieldii, *Günth. op. cit.* p. 173, pl. xvi, fig. E; *Stoliczka, J. A. S. B.* xl, 1871, p. 423; *Theob. Cat.* p. 121.
Typhlops barmanus, *Stoliczka, P. A. S. B.* 1872, p. 144.

Snout rounded and strongly projecting; nostrils lateral. Rostral narrow, its upper portion about one third the width of the

head, extending to between the eyes; nasal nearly completely divided, the cleft proceeding from the second labial; a præocular, nearly as large as the ocular; eye distinct; præfrontal and frontal

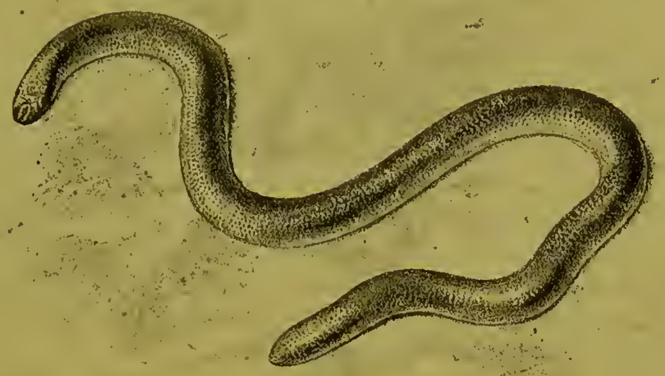

Fig. 70.—*Typhlops diardi.*

usually scarcely larger than the scales on the body, supraoculars and parietals broader; 4 upper labials. Diameter of body 29 to 34 times in the total length; tail as long as broad or broader than long, ending in a spine. 24 to 26 scales round the body. Olive-brown above, each scale with a more or less distinct light transverse streak; lower parts pale brownish or yellowish.

Total length 17 inches.

Hab. Bengal, Sikhim, Khási Hills, Assam, Burma, Cochin China.

277. Typhlops bothriorhynchus.

Typhlops bothriorhynchus, *Günth. Rept. B. I.* p. 174, pl. xvi, fig. G; *Anders. P. Z. S.* 1871, p. 168; *Stoliczka, J. A. S. B.* xl, 1871, p. 424; *Theob. Cat.* p. 122.

Snout rounded and strongly projecting; nostrils lateral; a rounded concavity on each side below the nostrils, and two others, less marked, on the third labial and on the side of the rostral. Rostral narrow, its upper portion about one third the width of the head, extending to between the eyes; nasal nearly completely divided, the cleft proceeding from the second labial and passing through the subnarial pit; a præocular, nearly as large as the ocular; eyes distinct; upper head-scales a little larger than the scales on the body; 4 upper labials. Diameter of body 30 times in the total length; tail about as long as broad, ending in a spine. 24 scales round the body. Dark brown above, paler beneath.

Total length 10 inches.

Hab. Northern India (Hardwár, N. W. P.; Garo Hills, Assam) and Malay Peninsula.

278. Typhlops porrectus.

Typhlops tenuis (*non Salv.*), *Jan, Icon. Ophid.* p. 10, l. 3, pls. iv, v, fig. 13.
Typhlops porrectus, *Stoliczka, J. A. S. B.* xl, 1871, p. 426, pl. xxv, figs. 1–4; *Theob. Cat.* p. 124; *Blanf. 2nd Yark. Miss., Rept.* p. 21; *Murray, Zool. Sind*, p. 374.

Snout round and moderately projecting; nostrils lateral. Rostral narrow, its upper portion about one third the width of the head, not extending quite to the level of the eyes, which are very indistinct; nasal semidivided, the cleft extending from the second labial to the nostril; præocular present, nearly as large as the ocular; upper head-scales a little larger than the scales on the body; 4 upper labials. Diameter of body 70 to 90 times in the total length; tail a little longer than broad, ending in a spine. 18 scales round the body. Brown above, paler beneath; snout, chin, and lower surface of tail white.

Total length 8·5 inches.

Hab. Himalayas, Northern India, from Sind to Bengal, Deccan.

279. Typhlops theobaldianus.

Typhlops theobaldianus, *Stoliczka, J. A. S. B.* xl, 1871, p. 429, pl. xxv, figs. 5–8; *Theob. Cat.* p. 123.

Snout round and strongly projecting; nostrils lateral. Rostral considerably more than one third (nearly half) the width of the head, reaching very far back on the top of the head; nasal semidivided, the cleft extending from the second labial to the nostril; a præocular, nearly as large as the ocular; eye very indistinct; præfrontal very slightly longer than frontal; 4 upper labials. Diameter of body about 70 times in the total length; tail nearly thrice as long as broad, terminating in an obtuse point, without spine. 22 scales round the body. Greyish brown, slightly paler below.

Total length 14 inches.

Hab. The single specimen known, which I have not seen, is, according to Stoliczka, in all probability from India, but without any specified locality.

280. Typhlops mirus.

Typhlops mirus, *Jan, Icon. Ophid.* p. 9, l. 1, pls. v, vi, fig. 7; *Günth. Rept. B. I.* p. 176, pl. xvi, fig. H; *Theob. Cat.* p. 126.

Snout round and moderately prominent; nostrils lateral. Rostral broad, about half the width of the head; nostril between two nasals, the anterior of which is small and in contact with the first and second labials; a præocular, nearly as large as the ocular, which is in contact with the fourth labial; a subocular, separating

the præocular and the ocular from the second and third labials; eye indistinct; upper head-scales a little larger than the scales on the body; 4 upper labials. Diameter of body 43 to 60 times in the total length; tail a little longer than broad, ending obtusely, without spine. 18 scales round the body. Brown above, snout and lower parts yellowish.

Total length 5·5 inches.

Hab. Ceylon.

281. Typhlops andamanensis.

Typhlops andamanensis, *Stoliczka, J. A. S. B.* xl, 1871, p. 428, pl. xxv, figs. 9–12; *Theob. Cat.* p. 124.

Snout round, moderately prominent; nostrils lateral. Width of rostral above about one third the width of the head; nostril between two nasals, the anterior of which is small and in contact with the first and second labials; a supraocular, nearly as large as the ocular; both the latter shields separated from the labials by a pair of suboculars; eye indistinct; upper head-scales scarcely enlarged; 4 upper labials. Diameter of body about 40 times in the total length; tail twice as long as broad, very obtuse and terminating in a minute point. 18 scales round the body. General colour above shining deep brownish black, the base of the scales being somewhat dull black; sides vinaceous, paler on the lower parts, which are throughout checkered with white; mouth and the tail below, including the tip, also mostly white.

Total length about 6·5 inches.

Hab. Andaman Islands. Known from a single specimen, which I have not seen.

282. Typhlops tenuicollis.

Onychocephalus (Ophthalmidion) tenuicollis, *Peters, MB. Ak. Berl.* 1864, p. 272, pl.—, fig. 2.
Typhlops tenuicollis, *Theob. Cat.* p. 123.

Snout round and moderately projecting; nostrils inferior. Rostral broad, its upper portion more than half as broad as the head; nasal semidivided, the cleft proceeding from the second labial; a præocular, about as large as the ocular; eye not distinguishable; præfrontal and frontal very broad, broader than the ocular and parietal; 4 upper labials. Diameter of body 65 times in the total length; tail as long as broad, terminal scute obtusely conical. 22 scales round the body. Olive-brown above, yellowish beneath.

Total length 14 inches.

Said to be from the Himalayas. Unknown to me.

283. Typhlops acutus.

Onychocephalus acutus, *Dum. & Bibr. Erp. Gén.* vi, p. 333; *Günth. Rept. B. I.* p. 177, pl. xvi, fig. A; *Theob. Cat.* p. 126.

Typhlops russellii (*non Schleg.*), *Gray, Cat. Liz.* p. 132.
Onychocephalus westermanni, *Lütk. Kjöbenhavn, Vidensk. Meddel.* 1862, p. 306, pl. i, fig. 5.
Typhlops excipiens, *Jan, Icon. Ophid.* 9, pl. i, fig. 5.

Snout pointed and hooked, with sharp horizontal edge and inferior nostrils. Rostral very large, extending posteriorly far beyond the level of the eyes; nostril close to rostral; nasal extending over the eye, in contact with and nearly as broad as the ocular; a præocular and a subocular; eye distinguishable; præfrontal and supraoculars much broader than the scales on the body; 4 upper labials. Diameter of body 40 to 60 times in the total length; tail as long as broad, or shorter, terminating in a spine. 28 to 34 scales round the middle of the body, 30 to 36 anteriorly. Pale brown above, each scale with or without a yellowish transverse streak; yellowish beneath.

Total length 2 feet.

Hab. Southern India and Deccan.

Family II. GLAUCONIIDÆ.

Cranial bones solidly united; no transpalatine; pterygoids not

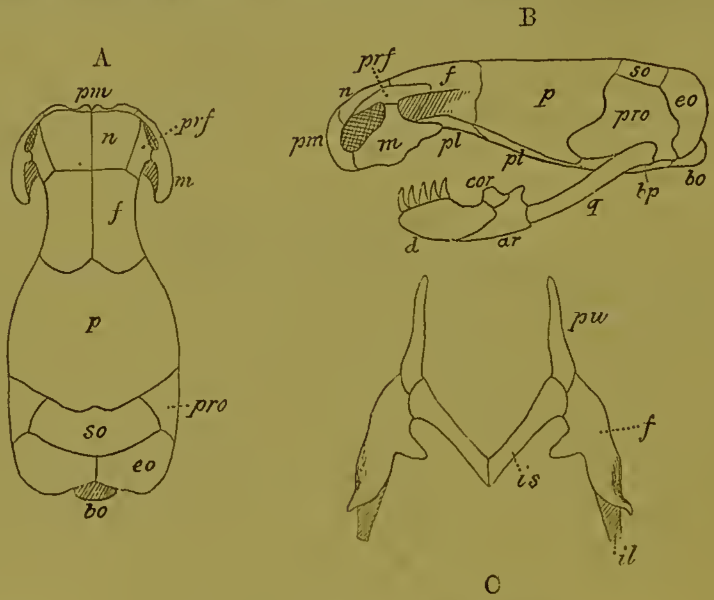

Fig. 71.—*Glauconia* (after Peters).

A. Upper view of skull. B. Side view of skull. C. Lower view of pelvis.

ar. Articular.
bo. Basioccipital.
bp. Basisphenoid.
cor. Coronoid.
d. Dentary.
eo. Exoccipital.
f (A, B). Frontal.
f (C). Femur.
il. Ilium.
is. Ischium.
m. Maxillary.
n. Nasal.
p. Parietal.
pl. Palatine.
pt. Pterygoid.
pm. Præmaxillary.
prf. Præfrontal.
pro. Prootic.
pu. Pubis.
q. Quadrate.
so. Supraoccipital.

extending to mandible; no supratemporal; præfrontals forming a suture with nasals; maxillary bordering the mouth, forming a suture with the præmaxillary, præfrontal, and frontal, toothless; no teeth on palate. Lower jaw toothed; coronoid bone present.

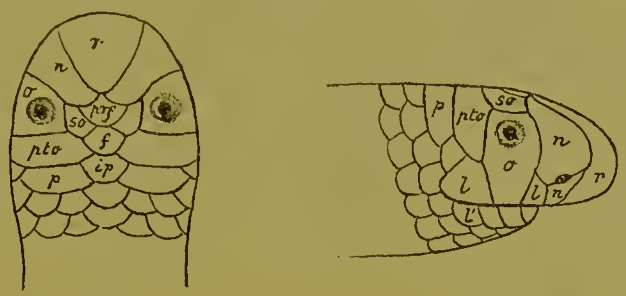

Fig. 72.—Head of *Glauconia blanfordii*.

A. Upper view. B. Side view.

f. Frontal. *o.* Ocular. *pto.* Postocular.
ip. Interparietal. *p.* Parietal. *r.* Rostral.
l. Labial. *prf.* Præfrontal. *so.* Supraocular.
n. Nasal.

Pelvis present, consisting of ilium, pubis, and ischium; the latter forming a ventral symphysis; a rudimentary femur. Body covered with uniform cycloid scales; eye under the shields.

Small worm-like Snakes, resembling the *Typhlopidæ* in general appearance and habits. A single genus, with about 15 species, of which one occurs in Sind.

Genus **GLAUCONIA** *,

Gray, Cat. Liz. p. 139, 1845.

Head with large shields. Præanal scales enlarged. Tail very short.

Distribution. Africa, South-western Asia, America.

284. **Glauconia blanfordii.**

Snout rounded; supraocular present, small; rostral nearly twice as broad as the nasals, reaching nearly to the level of the eyes; nasal completely divided into two; ocular bordering the lip, between two labials. Diameter of body 60 to 70 times in the total length, length of tail 12 to 14 times. 14 scales round the body. Pale brownish.

Total length $9\frac{1}{2}$ inches.

Hab. Sind. Five specimens are in the British Museum; they had been referred by Peters (*cf.* Günther, P. Z. S. 1869, p. 501) to *Stenostoma macrorhynchus*, Jan, which is, however, a very different species.

* *Stenostoma*, auct. Both the names *Stenostoma*, Wagler, and *Catodon*, Dum. & Bibr., are preoccupied in Zoology.

Family III. BOIDÆ.

Maxillaries, palatines, and pterygoids movable; transpalatine present; pterygoids extending to quadrate or mandible; supratemporal present, attached scale-like to the cranial walls, suspending quadrate; præfrontals forming a suture with nasals. Mandible with coronoid bone. Teeth in jaws and on palate. Vestiges of pelvis, formed of four elements, viz. ilium, pubis, ischium, and femur; the latter usually terminating in a claw-like spur visible on each side of the vent.

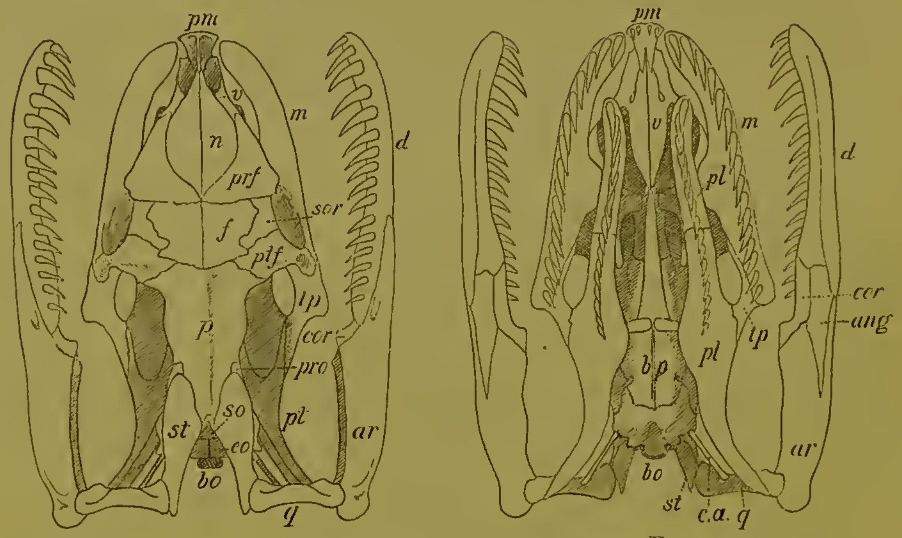

Fig. 73.—Skull of *Python reticulatus*.
A. Upper view. B. Lower view.

ang. Angular.	*f.* Frontal.	*pt.* Pterygoid.
ar. Articular.	*m.* Maxillary.	*ptf.* Postfrontal.
bo. Basioccipital.	*n.* Nasal.	*q.* Quadrate.
bp. Basisphenoid.	*p.* Parietal.	*so.* Supraoccipital.
c.a. Columella auris.	*pl.* Palatine.	*sor.* Supraorbital.
cor. Coronoid.	*pm.* Præmaxillary.	*st.* Supratemporal.
d. Dentary.	*prf.* Præfrontal.	*tp.* Transpalatine.
eo. Exoccipital.	*pro.* Prootic.	*v.* Vomer.

This family, which includes the largest Snakes, is represented all over the hotter parts of the globe. It may be divided into three subfamilies:—

1. *Pythoninæ.* Præmaxillary teeth and supraorbital bone present.
2. *Chondropythoninæ.* No præmaxillary teeth; a supraorbital bone.
3. *Boinæ.* No præmaxillary teeth; no supraorbital bone.

The first and third are represented in India.

Synopsis of Indian Genera.

I. *Pythoninæ.* Teeth in præmaxillary bone; a supra-orbital bone; subcaudals in two rows. [p. 245.
Head with large shields; a mental groove .... PYTHON,

II. *Boinæ.* Præmaxillary bone toothless; no supraorbital bone; subcaudals in a single row. [p. 246.
Head covered with small scales; no mental groove. GONGYLOPHIS,
Head covered with small scales; a mental groove. ERYX, p. 247.

Genus PYTHON,

Daudin, Hist. Rept. v, p. 226 (part.), 1803.

Anterior maxillary and mandibulary teeth very long. Head with large symmetrical shields; rostral, anterior upper labials and anterior and posterior lower labials with pits. Eye small, with vertical pupil. Scales very small, smooth. Tail prehensile; subcaudals in two rows.

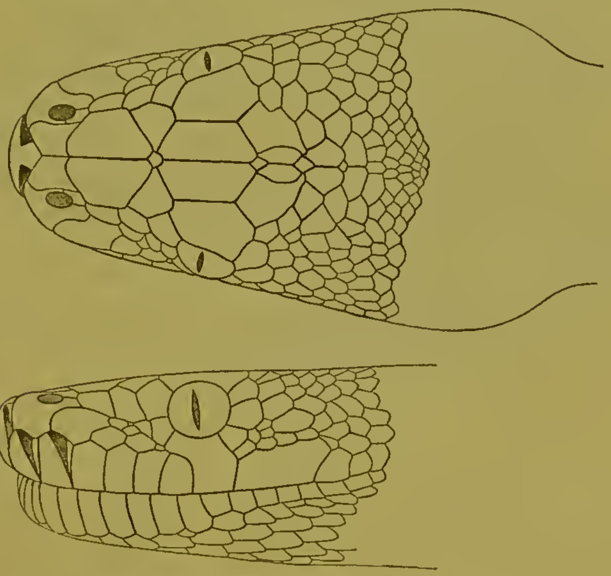

Fig. 74.—Head of *Python molurus.*

Pythons, or Rock-Snakes, are, like other *Boidæ*, oviparous; and the curious fact that the female incubates her eggs by coiling herself round them has been repeatedly observed in menageries. Snakes of this genus are nocturnal; they live on trees near the water, which they frequently enter, and they feed on mammals and birds.

Seven species of *Python* are known, four from Africa and three from Asia. The latter may be distinguished as follows:—

Four anterior upper labials pitted; 60–75 scales across the body; 297–330 ventrals; 82–102 subcaudals .... *P. reticulatus*, p. 246.

Two anterior upper labials pitted; 60–75 scales across the body; 242–265 ventrals; 60–72 subcaudals .... *P. molurus*, p. 246.

Two anterior upper labials pitted; 53–55 scales across the body; 160–175 ventrals; 28–32 subcaudals .... *P. curtus.*

P. curtus, Hubrecht, with which *P. breitensteini*, Steind., is probably identical, is only known from Sumatra, Borneo, and Singapore.

285. Python reticulatus.

Boa reticulata, *Schneid. Hist. Amph.* ii, p. 264.
Python schneideri, *Merr. Tent.* p. 89.
Python reticulatus, *Gray, Zool. Misc.* p. 44; *Dum. & Bibr. Erp. Gén.* vi, p. 426; *Cantor, J. A. S. B.* xvi, 1847, p. 902; *Günth. Rept. B. I.* p. 330; *Jan, Icon. Ophid.* p. 97, l. 8, pl. vi; *Stoliczka, J. A. S. B.* xxxix, p. 205; *Theob. Cat.* p. 205.

13 upper labials, four anterior pitted, seventh entering the eye; 21 to 23 lower labials; frontal usually not divided by a longitudinal suture; two præ- and three or four post-oculars. Scales in 60 to 75 rows. Ventrals 297–330; anal entire; subcaudals 82–102. Light yellowish or brown above, ornate with large circular or rhomboidal blackish markings; a median black line along the head; lower parts yellowish, with small brown spots on the sides.

Reaches a length of 30 feet.

Hab. Burma, Nicobars, Malay Peninsula and Archipelago.

286. Python molurus.

Russell, Ind. Serp. i, pls. xxii–xxiv and xxxix.
Coluber molurus, *Linn. S. N.* i, p. 387.
Python molurus, *Gray, Zool. Misc.* p. 44; *Dum. & Bibr. Erp. Gén.* vi, p. 417; *Günth. Rept. B. I.* p. 331; *Jan, Icon. Ophid.* p. 96, l. 8, pl. ii; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 205; *Theob. Cat.* p. 206; *Blanf. J. A. S. B.* xlviii, 1879, p. 127.

11 to 13 upper labials, two anterior pitted, seventh entering the eye, if not separated by a series of suboculars; 17 or 18 lower labials; frontal longitudinally divided; two præ- and three or four postoculars. Scales in 60 to 75 rows. Ventrals 242–265; anal entire; subcaudals 60–72. Greyish brown or yellowish above, with a dorsal series of large elongate subquadrangular reddish-brown black-edged spots and on each side a series of smaller spots; a lance-shaped brown marking on the head and nape; a lateral brown band passing through the eye and a brown vertical bar below the eye; lower parts yellowish, sides brown-spotted.

Grows to 20 feet, or more, but usually not exceeding about 12.

Hab. Peninsular India, Rajputana, and Bengal to the foot of the Himalayas; rare in the Malay Peninsula and Java, and in Ceylon. Haly (Rep. Coll. Snakes Colombo Mus. 1886, p. 14) says specimens of 10 feet or more were procurable in the Cinnamon Gardens only ten years ago, but they seem to have become extinct with the extension of the city of Colombo.

Genus GONGYLOPHIS.

Wagler, Syst. Amph. p. 192, 1830.

Anterior maxillary and mandibulary teeth a little longer than

the posterior. Head covered with small scales. No mental groove. Eye very small, with vertical pupil. Scales very small, keeled. Tail very short, slightly prehensile; subcaudals simple.

A single species.

287. Gongylophis conicus.

Russell, Ind. Serp. i, pl. iv.
Boa conica, *Schneid. Hist. Amph.* ii, p. 268, *id. Denkschr. Münch. Acad.* vii, 1821, p. 119, pl. vi, fig. 2.
Gongylophis conicus, *Gray, Zool. Misc.* p. 45; *Günth. Rept. B. I.* p. 333; *Theob. Cat.* p. 207; *Murray, Zool. Sind,* p. 386.
Eryx conicus, *Dum. & Bibr. Erp. Gén.* vi, p. 470; *Jan, Icon. Ophid.* p. 73, l. 4, pl. iii.

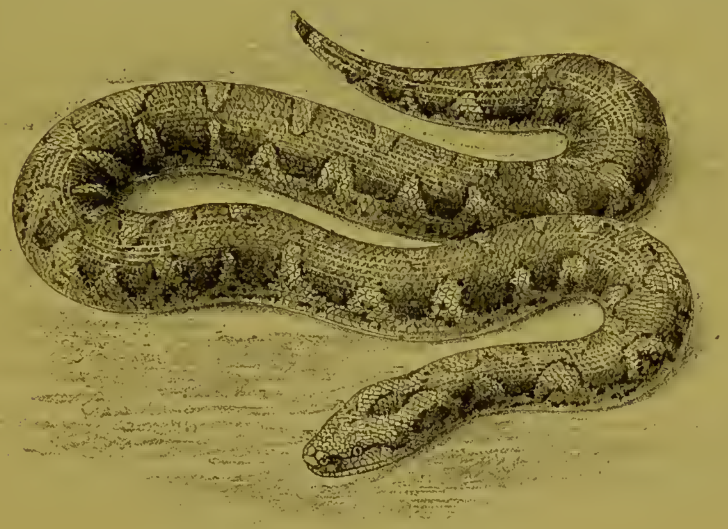

Fig. 75.—*Gongylophis conicus.*

Rostral about twice as broad as deep, feebly prominent, not keeled; only the nasals and internasals enlarged, the rest of the head covered with small obtusely keeled scales; 8 to 10 scales from eye to eye across the forehead; 10 to 15 scales round the eye, which is separated from the labials by one or two rows of scales; 12 to 14 upper labials. Scales tubercularly keeled; the keels very strong on the tail, in 40 to 47 rows. Ventrals 168–176; anal entire; subcaudals 17–24. Tail tapering to a point. Yellowish or brownish grey, with a broad zigzag band or series of dark brown black-edged spots along the back; lower parts uniform white.

Total length 2 feet; tail 2 inches.

Hab. India, from Sind to Bengal and the Anaimallai Hills. Feeds on mice; a specimen I kept alive showed a fierce temper.

Genus ERYX,

Daudin, Hist. Rept. vii, p. 251 (part.), 1803.

Anterior maxillary and mandibulary teeth a little longer than

the posterior. Head covered with small scales; a mental groove. Eye very small, with vertical pupil. Scales very small, smooth or keeled. Tail very short, not or but very slightly prehensile; subcaudals simple.

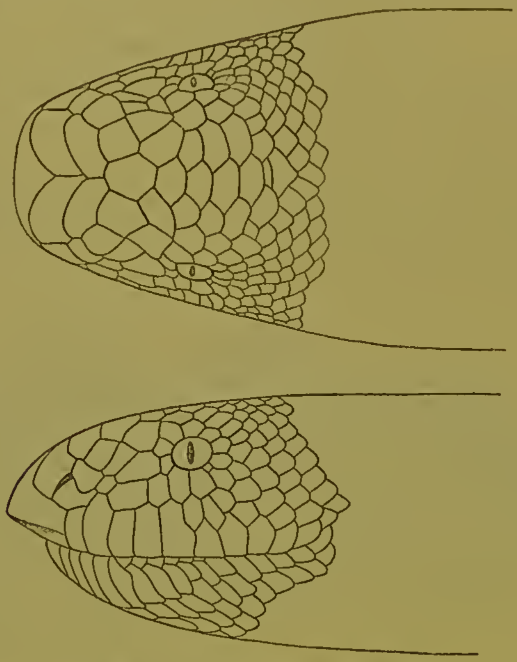

Fig. 76.—Head of *Eryx johnii.*

Distribution. The five or six species of this genus occur in the arid sandy regions of Southern Asia and North Africa.

288. Eryx johnii.

Boa johnii, *Russell, Ind. Serp.* ii, p. 18, pl. xvi, and pl. xvii, fig. 1.
Eryx johnii, *Dum. & Bibr. Erp. Gén.* vi, p. 458; *Günth. Rept. B. I.* p. 334; *Jan, Icon. Ophid.* p. 71, l. 4, pl. i, fig. 1; *Stolickza, P. A. S. B.* 1872, p. 84; *Theob. Cat.* p. 207; *Murray, Zool. Sind,* p. 385.

Rostral large and broad, with angular horizontal edge; two pairs of small shields behind the rostral; six to nine scales from eye to eye across the forehead; ten or eleven scales round the eye, which is separated from the labials by one or two rows of scales; 10 to 12 upper labials. Scales slightly keeled, in 51 to 65 rows. Ventrals 194–210; anal single; subcaudals 26–36. Tail very blunt, rounded at the end. Sandy grey, reddish, or pale brown above, uniform or with more or less distinct blackish transverse bands, these bands usually distinct on the tail; belly brown, or spotted with blackish; young often pale coral-red.

Total length 3 feet 3 inches; tail 3 inches.

Hab. Sandy tracts of Central and Southern India, the Punjab, Cutch, and Sind. Nocturnal; feeding on worms and small mammals. Commonly kept by snake-charmers.

Family IV. ILYSIIDÆ.

Cranial bones solidly united; transpalatine present; pterygoids extending to quadrate; supratemporal very small and wedged in between the adjacent bones; quadrate very short; præfrontals forming a suture with nasals. Mandible with coronoid bone. Teeth in jaws and on palate. Vestiges of pelvis, formed of three or four elements, as in the *Boidæ*, and terminating in a claw-like spur usually distinguishable on each side of the vent.

This family forms a passage from the *Boidæ* to the *Uropeltidæ*, agreeing with the latter in the physiognomy and scaling, with the former in the presence of vestiges of pelvis, whilst the skull is exactly intermediate.

Only two genera are known, the South-American *Ilysia* and the East-Indian *Cylindrophis*.

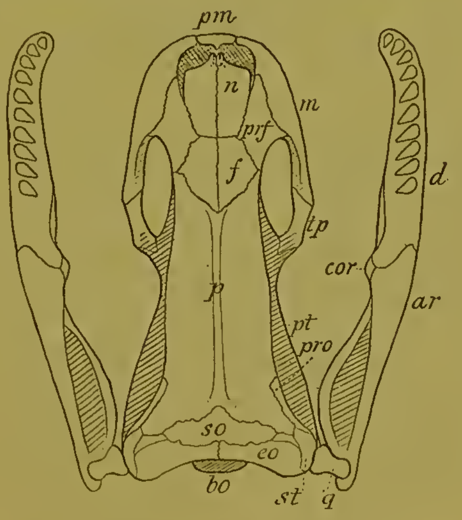

Fig. 77.—Skull of *Cylindrophis rufus*.

ar. Articular.
bo. Basioccipital.
cor. Coronoid.
d. Dentary.
co. Exoccipital.
f. Frontal.
m. Maxillary.
n. Nasal.
p. Parietal.
pm. Præmaxillary.
prf. Præfrontal.
pro. Prootic.
pt. Pterygoid.
q. Quadrate.
so. Supraoccipital.
st. Supratemporal.
tp. Transpalatine.

Genus CYLINDROPHIS,

Wagler, Icon. Amph., 1828.

Teeth moderate, subequal, 10 to 12 in each maxillary; none in præmaxillary. Head not distinct from neck; eye very small, with round or vertically subelliptical pupil, distinct from the neighbouring shields; a mental groove; head with large symmetrical shields *;

* For the terms applied to the shields of the head, see fig. 87, p. 278.

nostril in a single nasal, which forms a suture with its fellow behind the rostral; no loreal or præocular; a small postocular. Body cylindrical; scales smooth, in 19 or 21 rows; ventrals feebly enlarged. Tail extremely short and blunt.

Burrowing snakes, only occasionally found above ground. Feeding on insects, worms, and small mammals. Ovoviviparous.

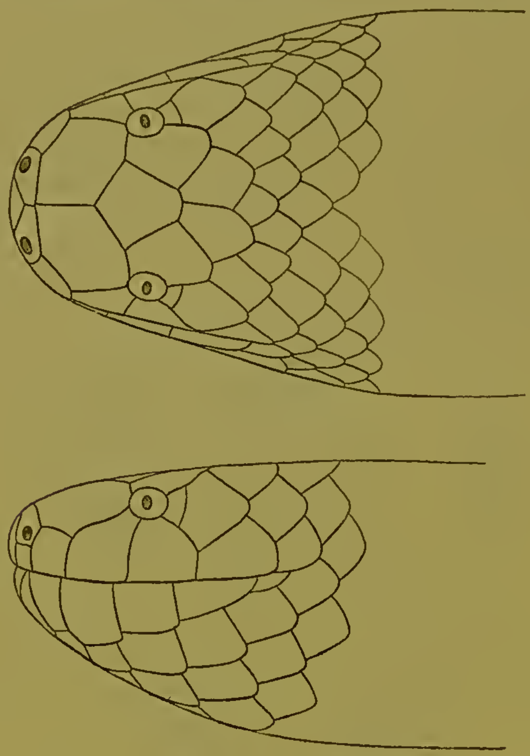

Fig. 78.—Head of *Cylindrophis rufus*.

Synopsis of the Species.

A. Diameter of eye $\frac{1}{2}$ to $\frac{2}{5}$ its distance from nostril; interocular width more than length of snout . . . . *C. rufus*, p. 250.

B. Diameter of eye $\frac{1}{3}$ to $\frac{1}{4}$ its distance from nostril; interocular width equal to length of snout.

- *a.* Parietals at least as large as frontal . . . . . . *C. maculatus*, p. 251.
- *b.* Parietals smaller than frontal . . . . *C. lineatus*.

C. lineatus, Blanf., is only known from Singapore.

289. **Cylindrophis rufus.**

Anguis ruffa, *Laur. Syn. Rept.* p. 71.
Anguis scytale, *Russell, Ind. Serp.* ii, p. 31, pls. xxvii, xxviii.
Cylindrophis resplendens, *Wagl. Icon. Amph.* pl. v, fig. 1.
Cylindrophis melanotus, *Wagl. l. c.* (annot.); *Dum. & Bibr. Erp. Gén.* vi, p. 592.

Cylindrophis rufa, *Gray, Zool. Misc.* p. 46; *Dum. & Bibr. t. c.* p. 595; *Cantor, J. A. S. B.* xvi, 1847, p. 900; *Günth. Rept. B. I.* p. 179; *Jan, Icon. Ophid.* p. 56, l. 9, pl. iv, figs. 1, 2; *Theob. Cat.* p. 127.

Diameter of the eye about half or two fifths its distance from the nostril. The distance between the eyes greater than the length of the snout. Frontal at least as large as the supraoculars, larger than the parietals, at least as long as its distance from the rostral. Six upper labials, third and fourth entering the eye. Scales in 19 or 21 rows. Ventrals not twice as large as the contiguous scales, 185–245; anal divided; subcaudals 5–10. Brown or black above, with or without alternating light cross-bands: belly white with transverse black bands or spots, or black with transverse white bands; lower surface of tail bright vermilion during life.

Total length 2 feet 5 inches.

Hab. Burma and Cochin China to the Malay Peninsula and Archipelago.

290. Cylindrophis maculatus.

Anguis maculata, *Linn. Syst. Nat.* i, p. 391; *Russell, Ind. Serp.* ii, p. 33, pl. xxix.
Cylindrophis maculata, *Gray, Zool. Misc.* p. 46; *Dum. & Bibr. Erp. Gén.* vi, p. 597; *Günth. Rept. B. I.* p. 179; *Jan, Icon. Ophid.* p. 56, l. 9, pl. iv, fig. 3; *Theob. Cat.* p. 127.

Diameter of the eye one third to one fourth its distance from the nostril. The distance between the eyes equals the length of the snout. Frontal usually a little smaller than the supraocular or parietal; six upper labials, third and fourth entering the eye. Scales in 19 or 21 rows. Ventrals not twice as large as the contiguous scales, 189–201; anal divided; subcaudals 4–6. Above with black network enclosing two series of large reddish-brown spots along the back; lower parts white, variegated with black.

Total length 1 foot 2 inches.

Hab. Ceylon.

Family V. UROPELTIDÆ.

Cranial bones solidly united; transpalatine present; pterygoid not extending to quadrate or mandible; no supratemporal; quadrate very small; præfrontals forming a suture with nasals. Mandible with coronoid bone. Both jaws toothed, teeth small and few; palate toothless*.

Head small and not distinct from neck; eye small or very small, with round pupil. Body cylindrical, rigid; tail very short. Size small.

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* Peters has recorded the presence of palatine teeth in *Melanophidium* and *Platyplectrurus*, but I fail to detect any in the British Museum specimens.

Distribution. This family is restricted to the mountains of Ceylon and those of Peninsular India, from the Bombay hills on the west and the Jeypore (Vizagapatam) hills on the east, southwards, or to the heavy forests at the immediate foot of the mountains.

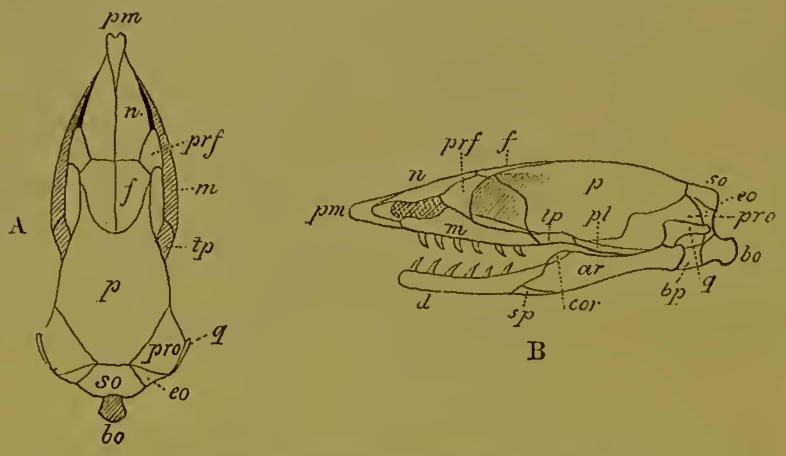

Fig. 79.—Skull of *Silybura grandis*.
A. Upper view. B. Side view.

ar.	Articular.	*f.*	Frontal.	*prf.*	Præfrontal.
bo.	Basioccipital.	*m.*	Maxillary.	*pro.*	Prootic.
bp.	Basisphenoid.	*n.*	Nasal.	*q.*	Quadrate.
cor.	Coronoid.	*p.*	Parietal.	*so.*	Supraoccipital.
d.	Dentary.	*pt.*	Pterygoid.	*sp.*	Splenial.
eo.	Exoccipital.	*pm.*	Præmaxillary.	*tp.*	Transpalatine.

The *Uropeltidæ* are burrowing reptiles, hence the name "Earth-snakes" by which they are generally known; they are often dug up about coffee- and tea-estates. Colonel Beddome, to whom science is indebted for the discovery of the great majority of the known species, obtained most of his specimens from under logs and large stones in the forests; but some are also found on the grass-land at high elevations, and during the rainy season individuals are not unfrequently found about the roads. They are ovovivi-parous, and live almost entirely upon earth-worms. Many are beautifully coloured with red and yellow when alive; and the black forms are remarkable for their iridescence, which is only equalled by that of *Xenopeltis unicolor* and some smooth-scaled Scinks.

The following names in Jerdon's Catalogue (J. A. S. B. xxii, 1854, p. 527) refer, in all probability, to snakes of this family; but the definition of these species renders their recognition impossible, and deprives such names, in the absence of type specimens, of any possible claim to priority:—

Cylindrophis curticeps, *Cylindrophis macroscelis*, *Pilidion? montanum*, *Uropeltis affinis*, *Xenopeltis? trivirgatus*. All from the Nilgiris.

Synopsis of the Genera.

A. Eye in the ocular shield; fourth labial in contact with the parietal.
  a. No mental groove.
    a'. No supraocular shield.
      a''. Tail obliquely truncated, ending in a large, rugose, circular or oval, flat shield .... UROPELTIS, p. 253.
      b''. Tail ending in a large convex rugose shield, which is neither truncated nor spinose at end . . RHINOPHIS, p. 254.
      c''. Terminal caudal scute small, square at the end or bicuspid, the points side by side .... SILYBURA, p. 257.
      d''. Tail compressed, the terminal scute with two superposed, single or bifid points .... PSEUDOPLECTRURUS, [p. 270.
    b'. A supraocular shield .... PLECTRURUS, p. 270.
  b. A median groove along chin .... MELANOPHIDIUM, p. 272.
B. Eye distinct from surrounding shields; a temporal shield separates fourth labial from parietal .... PLATYPLECTRURUS, p. 273.

Genus **UROPELTIS**,

Cuvier, Règne An., 2nd ed., ii, p. 76 (part.), 1829.

Eye in the ocular shield. No mental groove. No supraocular;

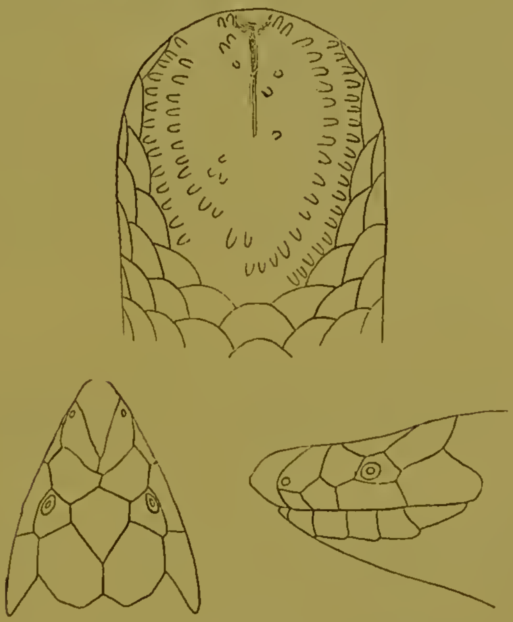

Fig. 80.—*Uropeltis grandis*.
Upper surface of tail and upper and side views of head.

no temporal. Tail obliquely truncated, ending in a large, rugose, circular or oval, flat shield.

Distribution. Ceylon.

291. Uropeltis grandis.

Uropeltis philippinus, *Cuv. Règne An.*, 2nd ed., ii, p. 76; *Dum. & Bibr. Erp. Gén.* vii. p. 161, pl. lix, fig. 2; *Peters, Uropelt.* p. 20; *Jan, Icon. Ophid.* p. 46, l. 9, pl. ii, f. 1.
Uropeltis grandis, *Kelaart, Prodr.* ii, p. 15; *Günth. Rept. B. I.* p. 188; *Theob. Cat.* p. 132; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 9.
Uropeltis saffragamus, *Kelaart, l. c.* p. 15.
Uropeltis pardalis, *Kelaart, l. c.* p. 16.

Snout acutely pointed; rostral convex, much produced posteriorly, nearly as long as the frontal; nasals forming a suture behind the rostral. Diameter of body about one twentieth of the total length. 19 scales round the middle of the body, 23 behind the head. Ventrals not twice as large as the contiguous scales, 129–147; subcaudals 6–9. Caudal disk longer than the shielded part of the head. Dark brown or blackish above, with or without yellow spots; yellow beneath, with or without dark brown spots.

Total length 18 inches. The largest species of the family.

Hab. Ceylon (Central Provinces).

Genus RHINOPHIS,

Hemprich, Grundr. d. Naturg. p. 119, 1829.

Eye in the ocular shield. No mental groove. No supraocular; no temporal. Tail ending in a large convex rugose shield, which is neither truncated nor spinose at the end. In all the species the nasals are separated by the rostral.

Of the six species, five are from Ceylon and one from Southern India.

Synopsis of the Species.

A. Caudal shield as long as shielded part of head.
  a. Rostral strongly keeled, half as long as shielded part of head.
    a'. Diameter of body 37 to 39 times in total length; ventrals 217–223 .... *R. oxyrhynchus*, p. 255.
    b'. Diameter of body 47 to 49 times in total length; ventrals 236–246 .... *R. punctatus*, p. 255.
  b. Rostral not half as long as shielded part of head.
    a'. Diameter of body 24 to 34 times in total length; ventrals 153–172; 17 scales round middle of body .... *R. planiceps*, p. 255.
    b'. Diameter of body 26 to 30 times in total length; ventrals 190–204; 17 scales round middle of body .... *R. trevelyanus*, p. 256.
    c'. Diameter of body 30 to 38 times in total length; ventrals 182–214; 15 scales round middle of body .... *R. sanguineus*, p. 256.
B. Caudal shield much shorter than shielded part of head .... *R. blythii*, p. 256.

292. Rhinophis oxyrhynchus.

Typhlops oxyrhynchus, *Schneid. Hist. Amph.* ii, p. 341.
Rhinophis oxyrhynchus, *Hempr. Grundr. d. Naturg.* p. 119; *Dum. & Bibr. Erp. Gén.* vii, p. 156; *Peters, Uropelt.* p. 9, pl. ii, fig. 1; *Günth. Rept. B. I.* p. 184; *Theob. Cat.* p. 128; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 5.
Dapatnaya lankadivana, *Kelaart, Prodr.* ii, p. 16.
Mytilia unimaculata, *Gray, P. Z. S.* 1858, p. 264, fig. 4.

Snout acutely pointed; rostral compressed, keeled above, half as long as the shielded part of the head, separating the nasals; frontal not longer than broad. Diameter of body 37 to 39 times in the total length. 17 to 19 scales round the middle of the body, 19 to 21 behind the head. Ventrals only a little larger than the contiguous scales, 217–223; subcaudals 5–7. Caudal disk about as long as the shielded part of the head. Uniform brown, each scale with a lighter margin; some yellow markings about the tail.

Total length 17 inches.

Hab. Ceylon (Central Provinces).

293. Rhinophis punctatus.

Rhinophis punctatus, *Müll. in Tiedem. Zeitschr. f. Physiol.* iv. 1832, p. 248; *Dum. & Bibr. Erp. Gén.* vii, p. 157; *Peters, Uropelt.* p. 12, pl. ii, fig. 3; *Günth. Rept. B. I.* p. 184; *Jan, Icon. Ophid.* p. 48, l. 9, pl. ii, fig. 5; *Theob. Cat.* p. 128; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 6.

Very closely allied to the preceding; differs in the more slender body, the diameter of which is contained 47 to 49 times in the total length, in the more numerous ventrals (236–246), and in coloration. Yellowish, each scale with a black spot; the scales of the series adjoining the vertebral without spot.

Total length 15 inches.

Hab. Ceylon (Central Provinces).

294. Rhinophis planiceps.

Typhlops philippinus, *Cuv. Règne An.* 2nd ed., ii, p. 74.
Rhinophis philippinus, *Müll. in Tiedem. Zeitschr. f. Physiol.* iv, 1832, p. 249; *Dum. & Bibr. Erp. Gén.* vii, p. 154, pl. lix, fig. 1; *Peters, Uropelt.* p. 15; *Günth. Rept. B. I.* p. 184; *Jan, Icon. Ophid.* p. 46, l. 9, pl. ii, fig. 2.
Rhinophis planiceps, *Peters, op. cit.* p. 17, pl. i, fig 9; *Theob. Cat.* p. 129; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 6.

Snout acutely pointed; rostral obtusely keeled above, about two fifths the length of the shielded part of the head, separating the nasals; frontal usually longer than broad. Diameter of body 24 to 34 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals only a little larger than the contiguous scales, 152–172; subcaudals 3–6. Caudal disk about

as long as the shielded part of the head. Uniform brown, each scale with a lighter margin; sometimes a yellowish blotch near the head or on the anal region.

Total length $10\frac{1}{2}$ inches.

Hab. Ceylon (Central Provinces).

295. Rhinophis trevelyanus.

Dapatnaya trevelyana, *Kelaart, Prodr.* ii, p. 17.
Mytilia gerrardi, *Gray, P. Z. S.* 1858, pp. 58 & 263, pl. xiii.
Rhinophis homolepis (*Hempr.*), *Peters, Uropelt.* p. 14, pl. ii, fig. 2; *Jan, Icon. Ophid.* p. 48, l. 9, pl. ii. fig. 4.
Rhinophis trevelyanus, *Günth. Rept. B. I.* p. 185; *Theob. Cat.* p. 129; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 7.

Snout acutely pointed; rostral obtusely keeled above, about two fifths the length of the shielded part of the head; frontal usually longer than broad. Diameter of body 26 to 30 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals only a little larger than the contiguous scales, 190–204; subcaudals 3–6. Caudal disk as long as the shielded part of the head. Blackish brown above; yellow beneath, each scale with a black spot; a series of triangular yellow spots along each side of the body.

Total length 11 inches.

Hab. Ceylon (Central Provinces).

296. Rhinophis sanguineus.

Rhinophis sanguineus, *Beddome, P. Z. S.* 1863, p. 227; *Günth. Rept. B. I.* p. 186, pl. xvii, fig. A; *Theob. Cat.* p. 130; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 8.
Rhinophis microlepis, *Beddome, P. Z. S.* 1863, p. 227, pl. xxvi, fig. 2.

Snout acutely pointed; rostral obtusely keeled above, about one third the length of the shielded part of the head; frontal longer than broad. Diameter of body 30–38 times in the total length. 15 scales round the middle of the body, 19 behind the head. Ventrals nearly twice as large as the contiguous scales, 182–214; subcaudals 5–10. Caudal disk as long as the shielded part of the head; subcaudal and præanal scales pluricarinate in the male. Bluish black above, with or without small light spots; belly and three or four outer series of scales bright red spotted with black; caudal shield black, with a red band on each side and sometimes a median one.

Total length 16 inches.

Hab. Western Ghats of Southern India (Wynaad 3000–4000 feet, forests near Pálghát, Anaimalais, Tinnevelly, and Travancore Ghats).

297. Rhinophis blythii.

Rhinophis blythii, *Kelaart, Prodr.* ii, p. 14; *Peters, Uropelt.* p. 17; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 8.

Mytilia templetonii, *Gray, P. Z. S.* 1858, p. 263.
Rhinophis blythii, part., *Günth. Rept. B. I.* p. 186; *Theob. Cat.* p. 130.

Snout acutely pointed; rostral very slightly compressed, about one third the length of the shielded part of the head; frontal longer than broad. Diameter of body 22 to 32 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals only a little larger than the contiguous scales, 148–162; subcaudals 4–7. Caudal disk one half or three fifths the length of the shielded part of the head; some of the distal caudal scales with faint traces of keels. Dark brown; sides with vertical yellow spots or a festooned or zigzag band along the anterior half of the body; a yellow ring round the base of the tail.

Total length 15 inches.

Hab. Ceylon (Central Provinces).

Genus SILYBURA,

Gray, Cat. Liz. p. 142, 1845.

Eye in the ocular shield. No mental groove. No supraocular; no temporal. Tail conical or obliquely truncated, terminating in a

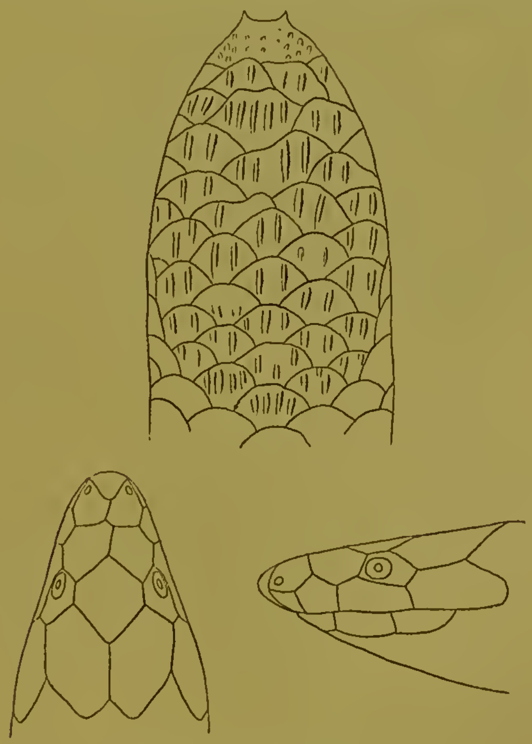

Fig. 81.—*Silybura brevis.*
Upper view of tail, and upper and side views of head.

small scute which is square at the end or bicuspid, with the points side by side.

Distribution. Peninsular India; one species in Ceylon.

Synopsis of the Species.

A. 19 scales round middle of body.
  a. Upper surface of tail convex.
    a'. 198–218 ventrals; diameter of body 30 to 40 times in total length .... *S. grandis,* p. 261.
    b'. 163–178 ventrals; diameter of body 23 to 30 times in total length .... *S. nigra,* p. 263.
  b. Tail with a flat disk of strongly keeled scales; 203–230 ventrals; diameter of body 34 to 40 times in total length.... *S. broughami,* p. 264.
B. 17 scales round middle of body.
  a. Rostral entirely separating nasals.
    a'. 141–166 ventrals; diameter of body 22 to 31 times in total length; eye not half length of ocular.............. *S. melanogaster,* p. 260.
    b'. 170–180 ventrals; diameter of body 30 to 38 times in total length; eye half length of ocular.................. *S. pulneyensis,* p. 260.
  b. Nasals in contact behind the rostral.
    a'. Eye not half length of ocular shield.
      a''. Portion of rostral seen from above as long as its distance from frontal, or shorter; snout obtuse.
        α. Tail round or slightly compressed; upper caudal scales distinctly keeled; terminal scute without distinct points; 151–180 ventrals; diameter of body 25 to 33 times in the total length ...... *S. petersii,* p. 261.
        β. Tail round or slightly compressed; upper caudal scales smooth or faintly keeled; terminal scute very small and bicuspid.
          α'. 154–165 ventrals; diameter of body 27 to 35 times in total length .... *S. maculata,* p. 261.
          β'. 174–188 ventrals; diameter of body 32 to 38 times in total length .... *S. liura,* p. 262.
        γ. Tail with a flat disk of strongly keeled scales; 165–172 ventrals; diameter of body 30 to 33 times in total length .... *S. rubrolineata,* p. 266.
      b''. Portion of rostral visible from above longer than its distance from frontal; upper caudal scales strongly keeled.
        α. Rostral not more than one third the length of shielded part of head.
          α'. 193–234 ventrals; diameter of body 30 to 46 times in total length; eye hardly one third length of ocular............ *S. ocellata,* p. 262.
          β'. 184–195 ventrals; diameter of

body 30 to 35 times in total length; eye more than one third length of ocular ...... *S. nitida*, p. 263.

γ'. 144–172 ventrals; diameter of body 25 to 32 times in total length .... *S. ellioti*, p. 265.

β. Rostral compressed, keeled above, at least two fifths length of shielded part of head; snout acutely pointed.

a'. 156–168 ventrals; diameter of body 26 to 32 times in total length; caudal disk quite flat. *S. dindigalensis*, p. 264.

β'. 213 ventrals; diameter of body 38 times in total length; rostral half length of shielded part of head .... *S. macrorhynchus*, p. 264.

γ'. 180–188 ventrals; diameter of body 33 to 40 times in total length .... *S. beddomii*, p. 265.

b'. Eye half length of ocular, or more; snout obtuse.

a''. Portion of rostral seen from above longer than its distance from frontal.

a. 144–157 ventrals; diameter of body 28 to 38 times in total length; rostral one third length of shielded part of head. *S. phipsonii*, p. 266.

β. 139–153 ventrals; diameter of body 25 to 32 times in total length; rostral not quite one third length of shielded part of head. .... *S. myhendræ*, p. 267.

b''. Portion of rostral visible from above as long as its distance from frontal.

a. 142–150 ventrals; diameter of body 30 to 32 times in total length .... *S. madurensis*, p. 267.

β. 127–133 ventrals; diameter of body 25 to 33 times in total length .... *S. rubromaculata*, p. 268.

c''. Portion of rostral visible from above shorter than its distance from frontal.

a. 128–130 ventrals; diameter of body 26 or 27 times in total length; eye half length of ocular .... *S. arcticeps*, p. 268.

β. 122–146 ventrals; diameter of body 21 to 29 times in total length; eye rather more than half length of ocular .... *S. brevis*, p. 268.

C. 15 scales round the middle of the body; 128–140 ventrals; diameter of body 24 to 29 times in total length .... *S. macrolepis*, p. 269.

298. Silybura melanogaster.

Mytilia (Crealia) melanogaster, *Gray, P. Z. S.* 1858, p. 264, fig. 5.
Plectrurus ceylonicus, *Peters, MB. Ak. Berl.* 1859, p. 388.
Rhinophis melanogaster, *Peters, Uropelt.* p. 18, pl. ii, fig. 4; *Jan, Icon. Ophid.* p. 47, l. 9, pl. ii, fig. 4.
Rhinophis blythii, part., *Günth. Rept. B. I.* p. 186; *Theob. Cat.* p. 130.
Silybura melanogaster, *Beddome, A. M. N. H.* (5) xvii, 1886, p. 20.

Snout pointed; rostral about one third the length of the shielded part of the head, the portion visible from above longer than its distance from the frontal, entirely separating the nasals; frontal longer than broad. Eye small, not half the length of the ocular shield. Diameter of body 22 to 31 times in the total length. Scales in 17 rows round the middle of the body, 19 behind the head. Ventrals but little larger than the contiguous scales, 141–166; subcaudals 6–10. Tail round or slightly compressed, the terminal scute with two small spines; caudal scales with very faint keels. Dark brown, with yellow spots more or less confluent into a lateral band; some young specimens yellow, each scale of the upper surface, chin, and tail with a dark brown spot.

Total length 10·5 inches.

Hab. Ceylon (Central Provinces).

299. Silybura pulneyensis.

Plectrurus pulneyensis, *Beddome, P. Z. S.* 1863, p. 228, pl. xxv, fig. 2.
Rhinophis pulneyensis, *Günth. Rept. B. I.* p. 187, pl. xvii, fig. C; *Theob. Cat.* p. 131.
Silybura wood-masoni, *Theob. op. cit.* p. 135.
Silybura guentheri, *Beddome, P. Z. S.* 1878, p. 801; *id. A. M. N. H.* (5) xvii, 1886, p. 23.
Silybura pulneyensis, *Beddome, t. c.* p. 23.

Snout obtusely pointed; rostral about one fourth the length of the shielded part of the head, longer than its distance from the frontal, entirely separating the nasals; frontal longer than broad. Eye half the length of the ocular. Diameter of body 30 to 38 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals about twice as large as the contiguous scales, 170–180; subcaudals 6–13. Tail somewhat compressed, the terminal scute with two small points; usually some of the terminal scales with faint keels. Brown, with a few minute yellow specks on the back; a yellow lateral band anteriorly; belly with large yellow, usually alternating, spots or cross bands, rarely uniform yellow,

Total length 15 inches.

Hab. Palni and Cumbum Hills, Madura district, 5000–7000 feet.

300. Silybura grandis.

Rhinophis grandis, *Beddome, Madras Journ. Med. Sc.* 1867; *Theob. Cat.* p. 131.
Silybura grandis, *Günth. A. M. N. H.* (4) i, 1868, p. 414; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 11.

Snout pointed; rostral one third or one fourth the length of the shielded part of the head, longer than its distance from the frontal, sometimes separating the nasals; frontal longer than broad. Eye very small, not half the length of the ocular. Diameter of body 30 to 40 times in the total length. Scales in 19 rows round the middle of the body, 21 behind the head. Ventrals about twice as large as the contiguous scales, 198–218; posterior ventrals pluricarinate in the male; subcaudals 6–12. Tail round or slightly compressed, the terminal scute with two small spines; caudal scales more or less strongly pluricarinate. Dark violet; belly with alternating large yellow spots or cross bands.

Total length 19 inches.

Hab. Anaimalai Hills, 4000–4700 feet.

301. Silybura petersii.

Silybura petersi, *Beddome, P. Z. S.* 1878, p. 154; *id. A. M. N. H.* (5) xvii, 1886, p. 22.

Snout obtusely pointed; rostral hardly one fourth the length of the shielded part of the head, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal longer than broad. Eye small, not half the length of the ocular. Diameter of body 25 to 33 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals about twice as large as the contiguous scales, 151–180; subcaudals 6–11. Tail round or slightly compressed, the terminal upper scales more or less distinctly pluricarinate; the terminal scute with a transverse ridge, without distinct points. Brown, with or without yellowish dots above; belly with small irregular yellowish spots; no yellow band on the side of the tail.

Total length 7·5 inches.

Hab. Anaimalai Hills, 4000–4700 feet.

302. Silybura maculata.

Silybura maculata, *Beddome, P. Z. S.* 1878, p. 154; *id. A. M. N. H.* (5) xvii, 1886, p. 22.

Snout obtuse; rostral about one fourth the length of the shielded part of the head, the portion visible from above as long as its distance from the frontal; nasals in contact; frontal longer than broad. Eye small, not half the length of the ocular. Diameter of body 27 to 35 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals nearly twice as large as the contiguous scales, 154–165; subcaudals 8–13. Tail rounded or a little compressed; scales smooth or a few of the terminals faintly keeled; terminal scute very small, bicuspid.

Dark brown or black, with several deep red blotches along the sides of the anterior portion of the trunk and about the tail, rarely also along the whole of the body.

Total length 15 inches.

Hab. Anaimalai Hills, 6000 to 7000 feet.

303. Silybura liura.

Silybura liura, *Günth. P. Z. S.* 1875, p. 228, pl. xxxi, fig. B; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 18.

Snout obtusely pointed; rostral about one third the length of the shielded part of the head, the portion visible from above as long as its distance from the frontal; nasals in contact; frontal longer than broad. Eye small, not half the length of the ocular. Diameter of body 32 to 38 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as broad as the contiguous scales, 174–188; subcaudals 8–12. Tail round or slightly compressed, the terminal scute very small and bicuspid; caudal scales smooth or with very faint keels. Purplish brown above, each scale edged with darker, with transverse series of small yellow, black-edged ocelli; sides and lower parts with large alternating black and yellow spots or cross bands.

Total length 13 inches.

Hab. Tinnevelly and Madura Hills, 3000–5000 feet.

304. Silybura ocellata.

Silybura ocellata, *Beddome, P. Z. S.* 1863, p. 226, *and Madras Journ. Med. Sc.* 1863; *Günth. Rept. B. I.* p. 190, pl. xvii, fig. E; *Theob. Cat.* p. 133; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 17.

Silybura ochracea, *Beddome, P. Z. S.* 1878, p. 801; *id. A. M. N. H.* (5) xvii, p. 17.

Silybura dupeni, *Beddome, P. Z. S.* 1878, p. 801.

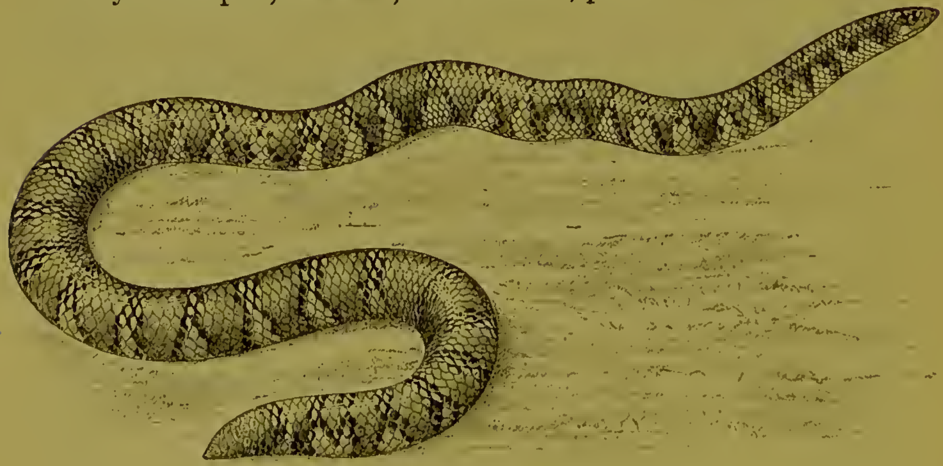

Fig. 82.—*Silybura ocellata.*

Snout pointed; rostral about one fourth the length of the shielded part of the head, the portion visible from above longer

than its distance from the frontal; nasals forming a suture behind the rostral; frontal usually longer than broad. Eye very small, hardly one third the length of the ocular. Diameter of body 30 to 46 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals about twice as large as the contiguous scales, 193–234; subcaudals 6–11. Tail round or slightly flattened, the terminal scute with two small points; scales on the upper surface of the tail strongly pluricarinate. Yellowish or brown above, usually with transverse series of small yellow black-edged ocelli; belly brown, with large yellow spots or cross bands, or yellow, mottled or blotched with brown.

Total length 20 inches.

Hab. Nilgiri, Anaimalai, and Tinnevelly Hills, 2000–4500 feet.

305. Silybura nigra.

Silybura melanogaster, *Günth. P. Z. S.* 1875, p. 227, pl. xxxi, fig. A.
Silybura nigra, *Beddome, P. Z. S.* 1878, p. 154; *id. A. M. N. H.* (5) xvii, 1886, p. 12.

Snout pointed; rostral one third to two fifths the length of the shielded part of the head, the portion visible from above longer than its distance from the frontal, sometimes separating the nasals; frontal a little longer than broad. Eye small, not half the length of the ocular. Diameter of body 23 to 30 times in the total length. Scales in 19 rows round the middle of the body, as well as behind the head. Ventrals about twice as large as the contiguous scales, 163–178; subcaudals 6–11. Tail rounded, the terminal scute with two small points; upper caudal scales more or less strongly pluricarinate. Blackish or dark violet, above with transverse series of small round yellow spots or ocelli; a lateral series of large yellow spots, which may be confluent into a band.

Total length 11 inches.

Hab. Palni, Anaimalai, Madura and Tinnevelly Hills, 4000–5000 feet.

306. Silybura nitida.

Silybura nitida, *Beddome, P. Z. S.* 1878, p. 154; *id. A. M. N. H.* (5) xvii, 1886, p. 19.

Snout obtusely pointed; rostral about one third the length of the shielded part of the head, the portion visible from above longer than its distance from the frontal; nasals in contact; frontal longer than broad. Eye small, not half the length of the ocular. Diameter of body 30 to 35 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as broad as the contiguous scales, 184–195; subcaudals 5–11. Tail round or slightly flattened above, the terminal scales strongly pluricarinate; the terminal scute with a transverse ridge and two more or less distinct points. Black, beneath with distant large yellow spots, which usually alternate but sometimes meet to form cross bands.

Total length 14 inches.

Hab. Anaimalai Hills, 4000-5000 feet.

307. Silybura dindigalensis.

Silybura dindigalensis, *Beddome, P. Z. S.* 1877, p. 167; *id. A. M. N. H.* (5) vii, 1886, p. 13.

Snout acutely pointed; rostral compressed, about two fifths the length of the shielded part of the head, the portion visible from above much longer than its distance from the frontal; nasals in contact behind the rostral; frontal longer than broad. Eye very small, not half the length of the ocular. Diameter of body 26 to 32 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as broad as the contiguous scales, 156–168; subcaudals 5–10. Tail obliquely truncated, flat above, with strongly pluricarinate scales; terminal scute with a transverse ridge and two more or less distinct points. Yellowish above, the scales edged with darker, with small dark brown spots; belly dark brown with yellow spots or irregular cross bars; a yellow streak on the lips, continued along each side of the neck.

Total length 14 inches.

Hab. Sirumalai Hills, Madura district, 4000–5000 feet.

308. Silybura broughami.

Silybura broughami, *Beddome, P. Z. S.* 1878, p. 800; *id. A. M. N. H.* (5) xvii, 1886, p. 11.
Silybura levingii, *Beddome, P. Z. S.* 1878, p. 801.

Snout acutely pointed; rostral compressed, obtusely keeled above, about two fifths the length of the shielded part of the head, the portion visible from above much longer than its distance from the frontal; nasals in contact behind the rostral; frontal as broad as long, or slightly longer than broad. Eye very small, not half the length of the ocular. Diameter of body 34 to 40 times in the total length. 19 scales round the middle of the body as well as behind the head. Ventrals not twice as broad as the contiguous scales, 203–230; subcaudals 7–10. Tail obliquely truncated, flat above, with strongly pluricarinate scales; terminal scute bicuspid. Brown above, with more or less distinct transverse series of small yellow, black-edged ocelli; sides with a series of large yellow spots; ventrals dark brown.

Total length 16·5 inches.

Hab. Sirumalai and Lower Palni Hills, 4000–5500 feet.

309. Silybura macrorhynchus.

Silybura macrorhyncha, *Beddome, P. Z. S.* 1877, p. 167; *id. A. M. N. H.* (5) xvii, 1886, p. 10.

Snout acutely pointed, much produced; rostral strongly compressed, keeled above, half the length of the shielded part of the head; nasals in contact behind the rostral; frontal as broad as long. Eye very small, not one third the length of the ocular. Diameter of body 38 times in the total length. 17 scales round the middle of the body and 19 behind the head. Ventrals not

quite twice as large as the contiguous scales, 213; subcaudals 6 (♀). End of tail subtruncated, the rugose part small and rather flat, the scales with 3 to 5 strong keels; terminal scute bicuspid. Upper parts uniform brown, lower parts mixed with yellow; a yellow streak from the mouth along each side of the neck; a yellow streak on each side of the lower surface of the tail, connected with its fellow by a cross bar on the anal region.

Total length 22·5 inches.

A single specimen is known, obtained above Ponachi, in the Anaimalais, at an altitude of 4000 feet.

310. Silybura beddomii.

Silybura beddomei, *Günth. A. M. N. H.* (3) ix, 1862, p. 56; *id. Rept. B. I.* p. 190, pl. xvii, fig. F; *Theob. Cat.* p. 133.
Silybura ellioti, part., *Beddome, A. M. N. H.* (5) xvii, 1886, p. 20.

Snout acutely pointed, much produced; rostral strongly compressed, keeled above, two fifths the length of the shielded part of the head; nasals in contact behind the rostral; frontal longer than broad. Eye very small, not half the length of the ocular. Diameter of body 33 to 40 times in the total length. 17 scales round the middle of body, 19 behind the head. Ventrals not twice as large as the contiguous scales, 180–188; subcaudals 6–7 (♀). End of tail subtruncated, convex or somewhat flattened above, the scales with 3 to 5 strong keels; terminal scute with a transverse ridge and two more or less distinct points. Brown, lower parts mixed with yellow; a yellow streak on each side of the neck; a yellow band across the anal region, none on the sides of the tail.

Total length 11 inches.

Hab. Anaimalai Hills.

311. Silybura ellioti.

Siluboura ceylonicus, *Gray, Cat. Liz.* p. 142.
Siloboura ellioti, *Gray, P. Z. S.* 1858, p. 262.
Silybura ellioti, *Peters, Uropelt.* p. 21; *Günth. P. Z. S.* 1875, p. 228.
Coloburus ceylanicus, *Jan, Icon. Ophid.* 9, pl. ii, fig. 6.
Silybura ellioti, part., *Günth. Rept. B. I.* p. 190; *Theob. Cat.* p. 133; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 20.
Silybura punctata, *Günth. P. Z. S.* 1875, p. 229.
Silybura beddomii, part., *Günth. l. c.* p. 228.

Snout pointed; rostral about one third the length of the shielded part of the head, the portion visible from above longer than its distance from the frontal; nasals in contact behind the rostral; frontal longer than broad. Eye very small, not half the length of the ocular. Diameter of body 25 to 32 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals nearly twice as large as the contiguous scales, 144–172; subcaudals 6–10. End of tail convex or somewhat flattened above; upper caudal scales with 3 to 6 strong keels; terminal scute with a

transverse ridge and two more or less distinct points. Dark brown, uniform or with yellow dots above and small yellow spots below, a more or less distinct yellow line on each side of the neck; a yellow band on each side of the tail, connected with its fellow by a transverse bar across the anal region.

Total length 9·5 inches.

Hab. This is the only species found in the Eastern hills of the peninsula of India. It is recorded from the Jeypore Hills (Vizagapatam district) and the Golgonda Hills. It is also known from the Western Gháts; Palni Hills, Anaimalais, Balarangams.

312. Silybura phipsonii.

Silybura ellioti, part., *Günth. Rept. B. I.* p. 190; *Theob. Cat.* p. 133; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 20.
Silybura ceylonica, part., *Günth. P. Z. S.* 1875, p. 228.
Silybura phipsonii, *Mason, A. M. N. H.* (6) i, 1888, p. 184.

Snout obtusely pointed; rostral one third the length of the shielded part of the head, the portion visible from above longer than its distance from the frontal; nasals in contact behind the rostral; frontal longer than broad. Eye rather more than half the length of the ocular. Diameter of body 28 to 38 times in the total length. Scales in 17 rows round the middle of the body, in 17 or 19 round the neck. Ventrals nearly twice as large as the contiguous scales, 144–157; subcaudals 7–12. End of tail flat above, obliquely truncated, with strongly bi-, tri- or quadricarinate scales; terminal scute with a transverse ridge and two more or less distinct points. Brown, uniform or with yellowish dots above; a more or less marked short yellow streak on each side, from the commissure of the mouth; a yellow band on each side of the tail, connected with its fellow by a transverse bar across the anal region.

Total length 11 inches.

Hab. Bombay Gháts, North Canara, and Mysore (Balarangam Hills).

313. Silybura rubrolineata.

Silybura rubrolineata, *Günth. P. Z. S.* 1875, p. 228; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 14.

Snout obtusely pointed; rostral about one fourth the length of the shielded part of the head, the portion visible from above as long as its distance from the frontal; nasals in contact; frontal as broad as long or slightly longer than broad. Eye small, not half the length of the ocular. Diameter of body 30 to 33 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as broad as the contiguous scales, 165–172; subcaudals 6–8. End of tail flat above, obliquely truncated, with strongly bi- or tricarinate scales; terminal scute

with a transverse ridge but no points. Blackish brown, with a more or less marked bright red band along each side.

Total length 16 inches.

Hab. Travancore and Anaimalai Hills.

314. Silybura myhendræ.

Silybura nilgherriensis, var. myhendræ, *Beddome, A. M. N. H.* (5) xvii, 1886, p. 15.

Snout obtuse; rostral not quite one third the length of the shielded part of the head, the portion visible from above a little longer than its distance from the frontal; nasals in contact; frontal slightly longer than broad. Eye more than half the length of the ocular. Diameter of body 25 to 32 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals at least twice as broad as the contiguous scales, 139–153; subcaudals 7. Tail obliquely truncated, flat above, with strongly bi- or tricarinate scales; terminal scute with a transverse ridge, indistinctly biscuspid. Dark purplish brown above, each scale with a crescentic yellowish posterior border; 3 or 4 or more dark transverse blotches behind the head, or along the whole length of the body, alternating and narrowing towards the belly; lower parts yellowish, with purplish-black spots.

Total length 13·5 inches; Mr. Mason possesses a specimen 18 inches long.

Hab. A single specimen is in the British Museum, the type, obtained by Col. Beddome on Myhendra Mountain, South Travancore. I have examined a second specimen, with the black cross bands continued along the whole length of the body, belonging to Mr. G. E. Mason, who received it with two others from near Mankompu, Punyat Hills, Travancore, about 3000 feet elevation.

315. Silybura madurensis.

Silybura madurensis, *Beddome, P. Z. S.* 1878, p. 802.

Silybura nilgherriensis, vars. arcticeps, part., et picta, *Beddome, A. M. N. H.* (5) xvii, 1886, p. 16.

Snout obtusely pointed; rostral about one fourth the length of the shielded part of the head, the portion visible from above as long as its distance from the frontal; nasals in contact; frontal longer tham broad. Eye measuring about half the length of the ocular. Diameter of body 30 to 32 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as large as the contiguous scales, 142–150; subcaudals 8–9. End of tail flat above, obliquely truncated, with strongly bi-, tri-, or quadricarinate scales; terminal scute with a transverse ridge and two points. Black above, uniform or closely spotted with yellow; belly orange, with alternating large black spots or cross bands; lower surface of tail black in the middle, orange on the sides.

Total length 14 inches.

Hab. North Travancore and Cumbum Hills, Madura district.

316. Silybura rubromaculata.

Silybura rubromaculata, *Beddome, Madras Journ. Med. Sc.* 1867; *Günth. P. Z. S.* 1875, p. 229; *Theob. Cat.* p. 135; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 14.

Snout obtuse; rostral a little more than one fourth the length of the shielded part of the head, the portion visible from above as long as its distance from the frontal; nasals in contact; frontal a little longer than broad. Eye half or somewhat more than half the length of the ocular. Diameter of body 25 to 33 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as broad as the contiguous scales, 127–136; subcaudals 8–10. End of tail flat above, obliquely truncated, with strongly bi- or tricarinate scales; terminal scute with a transverse ridge and two more or less distinct points. Dark olive-brown, uniform above; lower parts variegated with yellow and red; some red blotches on each side of the anterior part of the body, and one on each side of the tail near the vent.

Total length 13·5 inches.

Hab. Anaimalai Hills, 4000–4700 feet.

317. Silybura arcticeps.

Silybura arcticeps, *Günth. P. Z. S.* 1875, p. 229, fig.
Silybura nilgherriensis, var. arcticeps, part., *Beddome, A. M. N. H.* (5) xvii, 1886, p. 16.

Snout obtusely pointed; rostral about one fifth the length of the shielded part of the head, the portion visible from above measuring about half its distance from the frontal; nasals in contact; frontal much longer than broad. Eye measuring hardly half the length of the ocular. Diameter of body 26 or 27 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals nearly twice as large as the contiguous scales, 128–130; subcaudals 8. End of tail nearly flat above, obliquely truncated, with strongly bi- or tricarinate scales; terminal scute with a transverse ridge and two more or less distinct points. Brown above, with small yellowish dots; yellow beneath, with large black spots or cross bands.

Total length 8 inches.

Hab. Tinnevelly Hills, 3000–4000 feet.

318. Silybura brevis.

Uropeltis ceylanicus, *Cuv. Règne An.* 2nd ed. ii, p. 76; *Cocteau, in Guér. Mag. Zool.* 1833, cl. iii, pl. ii.
Coloburus ceylanicus, *Dum. & Bibr. Erp. Gén.* vii, p. 164, pl. lix, fig. 3.
Siloboura ceylonica, *Gray, P. Z. S.* 1858, p. 262.
Silybura ceylanica, *Peters, Uropelt.* p. 21.
Silybura ceylanica, part., *Peters, MB. Ak. Berl.* 1861, p. 903; *Günth. P. Z. S.* 1875, p. 228.

Silybura brevis, *Günth. A. M. N. H.* (3) ix, 1862, p. 56; *id. Rept. B. I.* p. 192, pl. xvii, fig. D; *id. P. Z. S.* 1875, p. 229; *Theob. Cat.* p. 134.
Silybura shortii, *Beddome, P. Z. S.* 1863, p. 225, pl. xxv, fig. 1; *Günth. Rept. B. I.* p. 191, pl. xvii, fig. G; *Theob. l. c.* p. 134.
Silybura nilgherriensis, *Beddome, P. Z. S.* 1863, p. 226, pl. xxvi, fig. 1; *id. A. M. N. H.* (5) xvii, 1886, p. 14.
Silybura bicatenata, *Günth. Rept. B. I.* p. 191, pl. xvii, fig. H; *id. P. Z. S.* 1875, p. 229; *Theob. Cat.* p. 134.
Silybura ellioti, part., *Günth. ll. cc.* pp. 190, 228; *Theob. l. c.* p. 133; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 20.
Silybura nilgherriensis, vars. shortii, annulata, *Beddome, l. c.* p. 15.

Snout rounded; rostral hardly one fourth the length of the shielded part of the head, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal a little longer than broad. Eye rather more than half the length of the ocular. Diameter of body 21 to 29 times in the total length. 17 scales round the middle of the body, 19 behind the head. Ventrals twice as large as the contiguous scales, 122–146; subcaudals 8–12. End of tail flat above, obliquely truncated, with strongly bi- tri- or quadricarinate scales; terminal scute with a transverse ridge and two more or less distinct points. Brown or blackish brown above, with or without yellowish spots or cross bands, or a yellow lateral band; belly yellowish, with or without dark brown spots, or entirely brown; lower surface of tail brown or black in the middle, yellow on the sides.

Total length 18 inches.

Hab. Wynaad, Nilgiri, Anaimalai, and Shevaroy Hills, 3000–7000 feet.

319. Silybura macrolepis.

Silybura macrolepis, *Peters, MB. Ak. Berl.* 1861, p. 904; *Günth. Rept. B. I.* p. 189, pl. xvii, fig. B; *Theob. Cat.* p. 132; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 24.

Snout rounded; rostral not one fourth the length of the shielded part of the head, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal as broad as long or slightly longer than broad. Eye more than half the length of the ocular. Diameter of body 24 to 29 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals twice as large as the contiguous scales, 128–140; subcaudals 7–9. End of tail flat above, obliquely truncated, with strongly tricarinate scales; terminal scute with a transverse ridge and two points. Black or dark purplish brown, each scale with a lighter edge; a short but broad yellow band on the lips and sides of neck, continued as a series of two to five large spots; a yellow band along each side of the tail.

Total length 12 inches.

Hab. Bombay Hills.

Genus PSEUDOPLECTRURUS.

Eye in the ocular shield. No mental groove. No supraocular; no temporal. Tail compressed, with the terminal scute compressed and with two superposed, simple or bifid points.

Distribution. Southern India.

320. Pseudoplectrurus canaricus.

Silybura canarica, *Beddome, Madras Journ. Med. Sc.* 1870.
Plectrurus canaricus, *Günth. P. Z. S.* 1875, p. 229; *Theob. Cat.* p. 137; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 27.

Snout obtuse; rostral hardly one fourth the length of the shielded part of the head, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal longer than broad. Eye not half the length of the ocular. Diameter of body 32 to 43 times in the total length. 15 scales round the middle of the body, 19 behind the head. Ventrals not twice as large as the contiguous scales, 172–188; subcaudals 6–13. Upper caudal scales smooth or feebly pluricarinate. Brownish violet, each scale usually paler in the centre; with or without yellow spots on the back; lips yellow; some yellow blotches on each side of the anterior part of the body; lower surface of tail yellow, with or without a black median streak.

Total length 17 inches.

Hab. Mountains of South Canara, 6000–6200 feet.

Genus PLECTRURUS,

Dum. & Bibr. Erp. Gén. vii, p. 166, 1854.

Eye in the ocular shield. No mental groove. A supraocular; no temporal. Tail compressed, with the terminal scute compressed and with two superposed, simple, bifid or trifid points.

Distribution. Southern India.

Synopsis of the Species.

A. Eye not quite half length of ocular shield; terminal caudal scute with two superposed simple points.
  a. Ventrals 152–165 .... *P. perroteti*, p. 271.
  b. Ventrals 180 .... *P. davisonii*, p. 271.

B. Eye half length of ocular; terminal caudal scute with two superposed bi- or tricuspid transverse ridges.
  a. Ventrals not twice as broad as contiguous scales. *P. guentheri*, p. 271.
  b. Ventrals twice as broad as contiguous scales .. *P. aureus*, p. 272.

321. Plectrurus perroteti.

Plectrurus perroteti, *Dum. & Bibr. Erp. Gén.* vii, p. 167, pl. lix, fig. 4; *Gray, P. Z. S.* 1858, p. 265; *Günth. Rept. B. I.* p. 193; *Jan, Icon. Ophid.* 9, pl. ii, fig. 7; *Theob. Cat.* p. 136; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 25.

Snout obtuse; rostral small, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal longer than broad. Eye hardly half the length of the ocular shield. Diameter of body 30 to 38 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals not quite twice as large as the contiguous scales, 152–165; subcaudals 7–12. Caudal scales more or less distinctly pluricarinate; terminal scute with two superposed single points. Brown or purplish, uniform, or each scale with darker edges.

Total length 13 inches.

Hab. Nilgiri and Anaimalai Hills, 4000–8000 feet.

322. Plectrurus davisonii.

Plectrurus davidsonii, *Beddome, A. M. N. H.* (5) xvii, 1886, p. 25.

This may eventually have to be united with *P. perroteti*, from which it differs in the somewhat more elongate body (39 times the diameter), the higher number of ventrals (180) and the brighter coloration; yellow, each scale edged with purple.

Total length 17 inches.

A single female specimen was obtained in the Anaimalais, at an altitude of 4700 feet, by Mr. W. Davison.

323. Plectrurus guentheri.

Plectrurus guentheri, *Beddome, P. Z. S.* 1863, p. 228, pl. xxvii; *Günth. Rept. B. I.* p. 193; *Theob. Cat.* p. 136; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 26.

Snout obtuse; rostral small, the portion visible from above shorter than its distance from the frontal; nasals in contact; frontal longer than broad. Eye half the length of the ocular. Diameter of body 36 to 42 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals not twice as large as the contiguous scales, 171–175; subcaudals 10–12 (♂). Caudal scales pluricarinate; terminal scute with two superposed bi- or tricuspid transverse ridges. Bright reddish purple above, this colour descending as triangular markings on the sides, which, like the belly, are yellow; the triangular markings sometimes extending across the belly.

Total length 14 inches.

Hab. Walaghát, below Sispara, western side of the Nilgiri Hills, 3500–4000 feet.

324. Plectrurus aureus.

Plectrurus aureus, *Beddome, P. Z. S.* 1880, p. 182; *id. A. M. N. H.* (5) xvii, 1886, p. 26.

Very closely allied to the preceding, the only structural difference being found in the ventrals, which are a little broader, viz. twice as broad as the contiguous scales. Diameter of body 39–44 times in the total length. Ventrals 164–177; subcaudals 8–12. Of a brilliant golden colour, brighter beneath; the scales edged with violet, with or without a few irregular narrow violet-black cross-bars on the back; the belly much ornamented with violet-black cross-bands or alternating spots.

Total length 16 inches.

Hab. Chambra Hill, Wynaad, 4500–6000 feet.

Genus MELANOPHIDIUM,

Günther, Rept. Brit. Ind. p. 193, 1864.

Eye in the ocular shield. A median groove along the chin. No supraocular; no temporal. Tail cylindrical or slightly compressed, the terminal scute pointed or with one or two vertical ridges.

Distribution. Southern India.

Synopsis of the Species.

A. Length of frontal equal to its distance from end of snout.
  a. Suture between ocular and frontal more than one third length of latter shield .... *M. wynadense*, p. 272.
  b. Suture between ocular and frontal less than one third length of latter shield .... *M. punctatum*, p. 273.
B. Length of frontal exceeds its distance from end of snout; suture between ocular and frontal less than one third length of latter shield .. *M. bilineatum*, p. 273.

325. Melanophidium wynadense.

Plectrurus wynandensis, *Beddome, P. Z. S.* 1863, p. 228.
Melanophidium wynandense, *Günth. Rept. B. I.* p. 194, pl. xvii, fig. 1; *Theob. Cat.* p. 138; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 30.

Snout rounded; rostral small, just visible from above; frontal as long as its distance from the end of the snout; suture between the ocular and the frontal more than one third the length of the latter shield. Eye very small. Diameter of body 44 to 48 times in the total length. 15 scales round the middle of the body, 17 or 19 behind the head. Ventrals rather more than twice the size of the contiguous scales, 176–185; subcaudals 10–15. Black, beautifully iridescent, uniform or with large yellow spots on the belly.

Total length 18 inches.

Hab. Near Manantoddy, Wynaad, 3000–5000 feet.

326. Melanophidium punctatum.

Melanophidium punctatum, *Beddome, Madras Journ. Med. Sc.* 1871; *Günth. P. Z. S.* 1875, p. 230, pl. xxxii, fig. B; *Theob. Cat.* p. 139; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 31.

Snout rounded; rostral small, just visible from above; frontal as long as its distance from the end of the snout; suture between the ocular and the frontal less than one third the length of the latter shield. Eye very small. Diameter of body 42 to 48 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals rather more than twice as broad as the contiguous scales, 184–198; subcaudals 15–18. Black above, beautifully iridescent; ventrals and the two lower series of scales on each side with a broad white border.

Total length 20 inches.

Hab. Travancore Hills, 4000–4500 feet.

327. Melanophidium bilineatum.

Melanophidium bilineatum, *Beddome, Madras Journ. Med. Sc.* 1870; *Günth. P. Z. S.* 1875, p. 230, pl. xxxii, fig. A; *Theob. Cat.* p. 138; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 30.

Snout rounded; rostral small, just visible from above; frontal longer than its distance from the end of the snout; suture between the ocular and the frontal less than one third the length of the latter shield. Eye very small. Diameter of body 40 to 50 times in the total length. 15 scales round the middle of the body, 17 or 19 behind the head. Ventrals rather more than twice as broad as the contiguous scales, 188–200; subcaudals 15–17. Black, beautifully iridescent; a broad yellow band, with or without a series of black dots, along each side, from the lips to the tail, where it unites with its fellow on the under surface.

Total length 14½ inches.

Hab. Peria Peak and Tirrhioot Peak, Wynaad, 4000 feet.

Genus PLATYPLECTRURUS,

Günther, A. M. N. H. (4) i, 1868, p. 414.

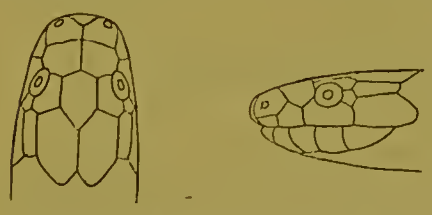

Fig. 83.—*Platyplectrurus trilineatus.* Upper and side views of head.

Eye distinct from the neighbouring shields, of moderate size. A supraocular and a temporal. Tail cylindrical or slightly compressed, the terminal scute pointed or with a transverse ridge.

Distribution. Southern India.

Synopsis of the Species.

a. Snout broadly rounded; supraoculars longer than præfrontals; 163–175 ventrals . . . . *P. trilineatus*, p. 274.
b. Snout broadly rounded; supraoculars as long as præfrontals; 150–175 ventrals . . . . *P. madurensis*, p. 274.
c. Snout obtuse; supraoculars as long as or shorter than præfrontals; 120–150 ventrals . . . . *P. sanguineus*, p. 274.

328. Platyplectrurus trilineatus.

Plectrurus trilineatus, *Beddome, Madras Journ. Med. Sc.* 1867, p. 14, fig.; *Theob. Cat.* p. 137.
Platyplectrurus trilineatus, *Günth. A. M. N. H.* (4) i, 1868, p. 413; *Beddome, A. M. N. H.* (5) xvii, 1886, p. 32.
Platyplectrurus bilineatus, *Beddome, l. c.* p. 33.

Snout broadly rounded; rostral small, just visible from above; frontal longer than broad; supraocular much larger than the eye, longer than the præfrontals; temporal two thirds or three fifths the length of the parietals. Diameter of body 37 to 50 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals nearly twice as broad as the contiguous scales, 163–175; subcaudals 8–16. Caudal scales smooth or a few of the terminal ones inconspicuously bi- or tricarinate; terminal scute with a transverse ridge which is hardly distinct in the female. Adult reddish brown or brick-red above, with three continuous or interrupted black longitudinal lines; young (*P. bilineatus*, Bedd.) dark brown or black above, with two yellowish dorsal bands; yellowish below, each scale with a brown dot.

Total length 16 inches.

Hab. Anaimalai Hills, 4000–4700 feet.

329. Platyplectrurus madurensis.

Platyplectrurus madurensis, *Beddome, P. Z. S.* 1877, p. 167; *id. A. M. N. H.* (5) xvii, 1886, p. 33.

Very closely allied to the preceding, but head-shields rather shorter and supraocular not longer than the præfrontals. Diameter of body 38 to 42 times in the total length. Ventrals 158–175, subcaudals 10–15. Above a nacreous purplish brown; ventrals and the two adjoining series of scales on each side white in the centre, purplish brown on the borders.

Total length 14 inches.

Hab. Palni and Travancore Hills, 4000–6000 feet.

330. Platyplectrurus sanguineus.

Plectrurus sanguineus, *Beddome, Madras Journ. Med. Sc.* 1867, p. 14, fig.; *Theob. Cat.* p. 136.
Platyplectrurus hewstoni, *Beddome, P. Z. S.* 1876, p. 701.

Plectrurus scabricauda, *Theob. Cat.* p. 136.
Teretrurus sanguineus, *Beddome, A. M. N. H.* (5) xvii, 1886, p. 28.
Teretrurus travancoricus, *Beddome, l. c.* p. 29.

Snout obtuse; rostral small, just visible from above; frontal longer than broad; supraocular not or scarcely larger than the eye, as long as the præfrontals or shorter; temporal about half the length of the parietals. Diameter of body 22 to 28 times in the total length. 15 scales round the middle of the body, 17 behind the head. Ventrals nearly twice as broad as the contiguous scales, 120–150; subcaudals 5–9. Caudal scales smooth or faintly keeled in the female; all the caudals and the last ventrals more or less distinctly pluricarinate in the males; tail ending in a simple, compressed point. Brown or purplish red above; belly red, uniform or more or less blotched with black.

Total length 9 inches.

Hab. Wynaad, Anaimalais, Travancore, 3000–4700 feet.

Family VI. XENOPELTIDÆ.

Cranial bones solidly united; transpalatine present; pterygoid extending to quadrate; supratemporal present, suspending quadrate; præfrontals forming a suture with nasals. Mandible without coronoid bone. Teeth in jaws, palate, and præmaxillary.

A single genus.

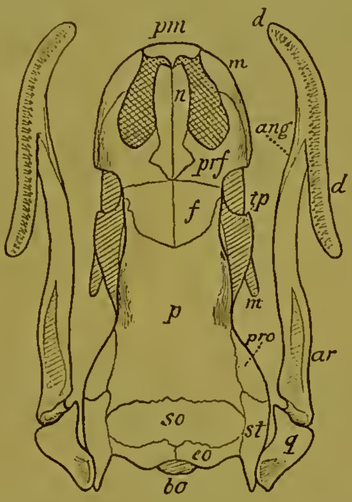

Fig. 84.—Upper view of skull of *Xenopeltis unicolor.*

ang. Angular.
ar. Articular.
bo. Basioccipital.
d. Dentary.
eo. Exoccipital.
f. Frontal.
m. Maxillary.
n. Nasal.
p. Parietal.
pm. Præmaxillary.
prf. Præfrontal.
pro. Prootic.
q. Quadrate.
so. Supraoccipital.
st. Supratemporal
tp. Transpalatine.

Genus XENOPELTIS,

Reinwardt, in Boie, Isis, 1827, p. 564.

Teeth small, equal, closely set, and very numerous (4 on each side of the præmaxillary, 33–38 in each maxillary, 35 or 36 in each ramus of the mandible). Dentary bone attached loosely to the apex of the articular and movable on it. Head not

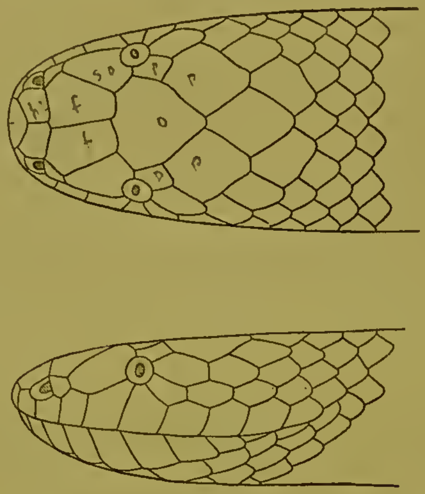

Fig. 85.—Head of *Xenopeltis unicolor.*

distinct from neck; eye small, with vertically elliptic pupil. Nostril between two small nasals; frontal in contact with a large azygous occipital shield, which is in the middle between four parietals. A mental groove. Body cylindrical; scales smooth, in 15 rows; ventrals large; tail short, subcaudals in two rows.

A single species.

331. Xenopeltis unicolor.

Xenopeltis unicolor, *Reinw. in Boie, Isis,* 1827, p. 564; *Cantor, J. A. S. B.* xvi, 1847, p. 901; *Dum. & Bibr. Erp. Gén.* vii, p. 28; *Günth. Rept. B. I.* p. 180; *Jan, Icon. Ophid.* 9, pl. v; *Theob. Cat.* p. 140.

Head much depressed, snout rounded; frontal as long as its distance from the rostral; supraocular small, smaller than the upper postocular; a single large præocular or loreal shield; 2 postoculars, upper largest; 8 upper labials, first in contact with the internasal, fourth and fifth entering the eye; a pair of very small chin-shields, in contact with the 3 anterior lower labials. Scales in 15 rows. Ventrals 166–193; anal divided; subcaudals 26–31. Black or brown above, highly iridescent, scales with lighter edges, white beneath; head whitish in the young.

Total length 3 feet 4 inches; tail 4 inches.

Hab. Burma, Indo-China, Malay Peninsula and Archipelago; also Trichinopoly, S. India.

A snake of fierce habits, feeding on small mammals.

Family VII. COLUBRIDÆ.

Facial bones movable; transpalatine present; pterygoid extending to mandible or quadrate; supratemporal present, attached scale-like to the skull and suspending quadrate; maxillary horizontal, not movable perpendicularly to the transpalatine. Mandible without coronoid bone. Both jaws toothed.

This large family, containing the bulk of the Ophidia, may bo divided into three parallel series :—

A. AGLYPHA. All the teeth solid, not grooved. Harmless.

B. OPISTHOGLYPHA. One or more of the posterior maxillary teeth grooved. Suspected, or poisonous to a slight degree.

C. PROTEROGLYPHA. Anterior maxillary teeth grooved or perforated. Poisonous.

In each of these series we have a more or less perfect repetition of forms, due to adaptation to the various modes of life.

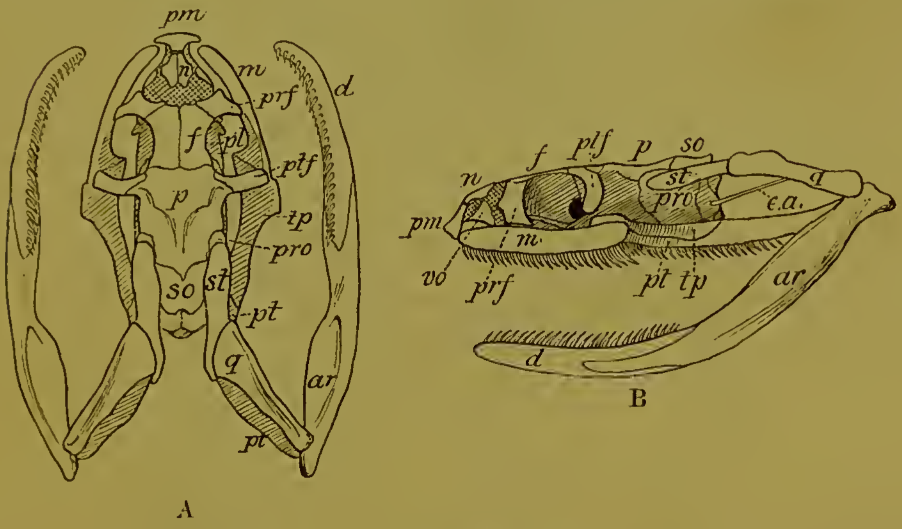

Fig. 86.—Skull of *Tropidonotus piscator*.
A. Upper view. B. Side view.

ar. Articular.
c.a. Columella auris.
d. Dentary.
f. Frontal.
m. Maxillary.
n. Nasal.
p. Parietal.
pl. Palatine.
pm. Præmaxillary.
prf. Præfrontal.
pro. Prootic.
pt. Pterygoid.
ptf. Postfrontal.
q. Quadrate.
so. Supraoccipital.
st. Supratemporal.
tp. Transpalatine.
vo. Vomer.

Synopsis of the Subfamilies represented in the Indian Fauna.

Series A. AGLYPHA.

Postfrontal bone not produced over the supraorbital region; scales imbricate	COLUBRINÆ, p. 279.
Postfrontal bone produced over the supraorbital region; scales not imbricate	ACROCHORDINÆ, p. 354

Series B. OPISTHOGLYPHA.

Nostrils lateral........................	DIPSADINÆ, p. 356.
Nostrils on the upper surface of the head..	HOMALOPSINÆ, p. 372.

Series C. PROTEROGLYPHA.

Tail round, caudal hypapophyses short....	ELAPINÆ, p. 382.
Tail compressed, caudal hypapophyses long.	HYDROPHIINÆ, p. 393.

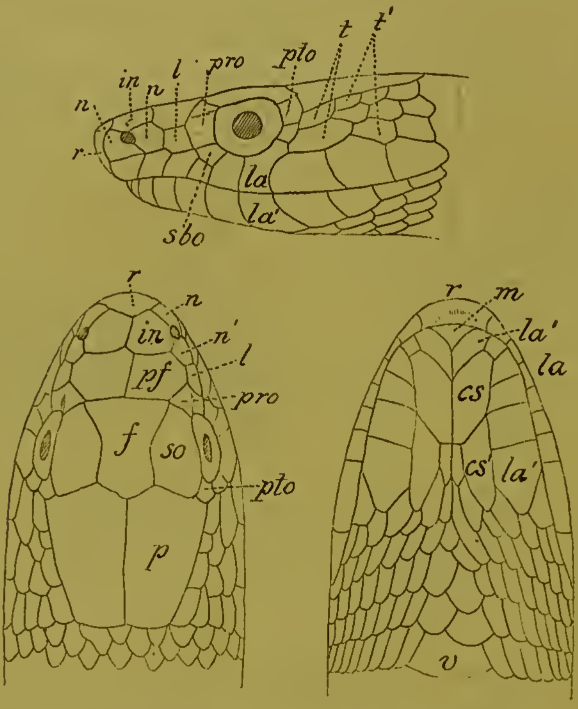

Fig. 87.—Three views of head of *Zamenis ventrimaculatus*, to explain the terminology of the head-shields.

cs. Chin-shields (anterior).
cs'. Chin-shields (posterior).
f. Frontal.
in. Internasal.
l. Loreal.
la. Upper labial.
la'. Lower labial.
m. Mental.
n. Nasal.
p. Parietal.
pf. Præfrontal.
pro. Præocular.
pto. Postocular.
r. Rostral.
sbo. Subocular.
so. Supraocular.
t. Temporals (first row).
t'. Temporals (second row).
v. First ventral.

Series A. **AGLYPHA.**

Subfamily I. COLUBRINÆ.

Postfrontal bone not produced over the supratemporal region. Scales imbricate. Head-shields and ventrals large.

Synopsis of Indian Genera *.

A. Terrestrial or arboreal Snakes, with the hypapophyses developed only on the anterior half of the vertebral column, and the nasal bones at least as large as the præfrontals.
  a. Posterior border of ventral shields without lateral notch.
    a′. Anterior mandibular teeth longer than the posterior; eye small or rather small.
      a″. No internasal or temporal shields. CALAMARIA, p. 281.
      b″. One or two internasals; temporals present.
        α. Posterior maxillary teeth a little longer than the anterior; pupil vertically subelliptic; subcaudals in two rows.
          α′. A loreal and a præocular .. TRACHISCHIUM, p. 284.
          β′. No loreal or præocular .... BLYTHIA, p. 287.
        β. Maxillary teeth equal in length; pupil round; subcaudals single.
          α′ Scales smooth .... ASPIDURA, p. 288.
          β′. Scales keeled.............. HAPLOCERCUS, p. 290.
        γ. Anterior maxillary teeth enlarged; pupil vertically elliptic. LYCODON, p. 291.
    b′. Mandibular teeth subequal in length, maxillary teeth equal, or posterior largest.
      a″. Eye very small, with round pupil; tail very short .... XYLOPHIS, p. 283.
      b″. Eye with vertically elliptic pupil; tail long.
        α. Eye large; ventrals strongly keeled .... HYDROPHOBUS, p. 297.
        β. Eye small; ventrals not keeled. PSEUDOCYCLOPHIS, p. 299.
        γ. Eye moderate; nostril an oblique slit between two nasals...... LYTORHYNCHUS, p. 322.

* Through the kind mediation of Mr. W. L. Sclater I have obtained from the Trustees of the Indian Museum communication of the types of Theobald's *Falconeria bengalensis* and *Cadmus cuneiformis*. The former is a North-American Snake, *Conocephalus striatulus*, the latter a South-African, *Coronella cana*.

c″. Eye rather small, moderate or large, with round pupil.
- a. Maxillary teeth few (6 to 12), very strongly enlarged posteriorly; eye rather small; rostral shield large.
  - α′. Pterygoids toothed .... SIMOTES, p. 309.
  - β′. Pterygoids toothless ...... OLIGODON, p. 317.
- β. 12 or more teeth in each maxillary, increasing in size posteriorly.
  - α′. Body moderate, not compressed; no subocular; eye rather small .... CORONELLA, p. 308.
  - β′. Body slender; a subocular below the præocular; longitudinal rows of scales in odd numbers .... ZAMENIS, p. 323.
  - γ′. Body slender; longitudinal rows of scales in even numbers .... ZAOCYS, p. 329.
- γ. 15 or more teeth in each maxillary, subequal in length.
  - α′. 40 to 50 teeth in each maxillary; scales in 17 rows .. POLYODONTOPHIS, p. 301.
  - β′. 15 to 30 teeth in each maxillary.
    - α″. Scales in 15 to 19 rows, without apical pits, vertebrals not enlarged ...... ABLABES, p. 304.
    - β″. Scales in 19 to 27 rows, with apical pits, vertebrals not enlarged ...... COLUBER, p. 330.
    - γ″. Scales in 17 rows, without apical pits, of vertebral row enlarged .... XENELAPHIS, p. 336.

b. Posterior border of ventral shields with a notch on each side corresponding to a suture-like lateral keel; scales in 13 or 15 rows.
- a′. Maxillary teeth equal in length; scales of vertebral row enlarged .. DENDROPHIS, p. 337.
- b′. Anterior maxillary teeth longest; vertebral scales not enlarged .... DENDRELAPHIS, p. 339.

B. Aquatic or semiaquatic Snakes, with the hypapophyses developed throughout the vertebral column, and very small nasal bones. Scales usually keeled.
- a. Posterior maxillary teeth longest.
  - a′. Scales on the anterior part of the body disposed obliquely, narrow and much imbricate .... PSEUDOXENODON, p. 340.
  - b′. Scales forming straight longitudinal series; two internasals.......... TROPIDONOTUS, p. 341.

c'. A single internasal; nostril in a semidivided nasal . . . . HELICOPS, p. 352.

b. Maxillary teeth subequal; nostril in a single nasal . . . . XENOCHROPHIS, p. 353.

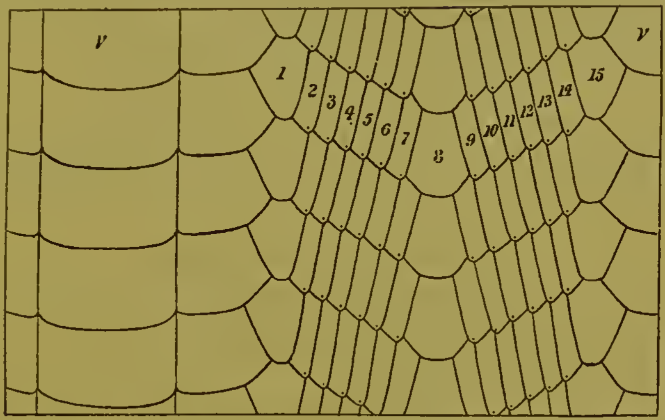

Fig. 88.—Scaling of body of *Dendrophis pictus*, showing the enlarged vertebral scales (8), the apical pit * on the oblique dorsal scales, and the lateral keel along the ventral shields (*v*).

Genus CALAMARIA,

Boie, Isis, 1827, p. 519.

Maxillary teeth 8 to 11, subequal; anterior mandibular teeth a little longer than the posterior. Head not distinct from neck;

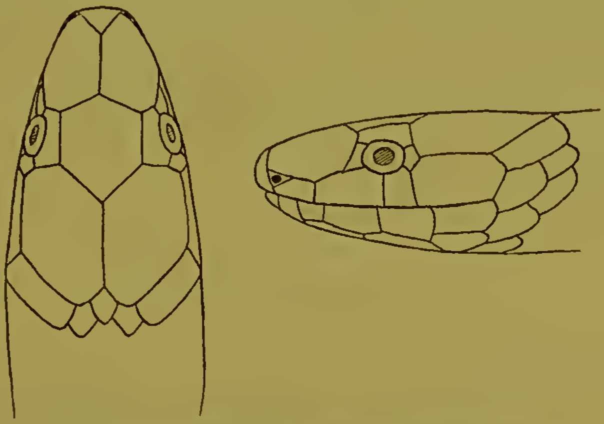

Fig. 89.—Head of *Calamaria pavimentata*.

eye small, with round pupil; nostril pierced in a very small nasal; no loreal; no internasals; præocular present or absent; no

* The apical pit is a minute impression near the extremity of the scale; these pits may be disposed in pairs. The character derived from the presence or absence of the apical pits appears to me of about the same systematic importance as the presence or absence of a keel on the dorsal scales, or the division or non-division of the subcaudal shields. In some cases it may aid in defining a natural genus, in others it breaks down as a generic character.

temporals, the parietals in contact with the labials. Body cylindrical, rigid; scales smooth, without apical pits, in 13 rows; tail short, subcaudals in two rows.

A genus of about thirty species, ranging from Assam (?), Burma, and Southern China to the Malay Archipelago, where they are most abundant in Java, Sumatra, and Borneo. Small snakes, usually found concealed under stones or fallen trees.

Synopsis of Indian and Burmese Species.

Subcaudals 13–27 . . . . *C. pavimentata*, p. 282.
Subcaudals 41 . . . . *C. catenata*, p. 282.

332. Calamaria pavimentata.

Calamaria pavimentata, *Dum. & Bibr. Erp. Gén.* vii, p. 71; *Jan, Icon. Ophid.* 10, pl. i, fig. 9.
Calamaria quadrimaculata, *Dum. & Bibr. t. c.* p. 73; *Jan, l. c.* fig. 10; *Günth. Rept. B. I.* p. 197.
Calamaria siamensis, *Günth. l. c.* p. 196; *Theob. Cat.* p. 140.

Rostral as deep as broad, well visible from above; frontal longer than broad, shorter than the parietals, twice to twice and a half as broad as the supraocular; one præ- and one postocular; four upper labials, second and fourth largest, second and third entering the eye; first pair of lower labials forming a suture behind the mental; two pairs of chin-shields, in contact with each other. Scales in 13 rows. Ventrals 140–182; anal entire; subcaudals 13–27. Tail pointed. Reddish brown above, with five dark longitudinal lines or series of spots; nape dark brown, separated from the back by a yellow collar; a pair of yellow spots at the base and another at the end of the tail; lower parts uniform yellowish, with a dark line along the tail in the Burmese and Javan specimens, obscured with brown mottlings or brown with lighter borders in the var. *siamensis*.

Total length 12·5 inches; tail 0·6.

Hab. Burma (Toungngoo, Rangoon), Siam, Cochinchina, Canton, Java.

333. Calamaria? catenata.

Calamaria catenata, *Blyth, J. A. S. B.* xxiii, 1854, p. 287; *Theob. Cat.* p. 141.

Frontal almost as large as the parietals. Scales in 13 rows. Ventrals 187; subcaudals 41. Predominant colour dusky above, formed by minute black specks upon a pale ground-tint; below pale buff and marked with lateral series of square black spots; four black lines throughout above, the upper bordering a pale medial streak, which is simple upon the tail, but along the body forms a concatenation of elongate oval spots; an imperfect whitish-buff collar, and similar marks before and behind the eye.

Total length 17 inches; tail $2\frac{1}{2}$.

Hab. This species, of which I have not seen any specimens, was described from Assam. I refer it with doubt to this genus.

Genus XYLOPHIS,

Beddome, P. Z. S. 1878, p. 576 *.

Maxillary teeth 20 to 25, small, equal; mandibular teeth equal. Head not distinct from neck; eye small, with round pupil; nostril

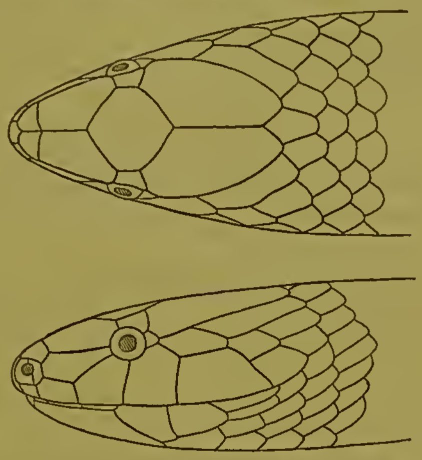

Fig. 90.—Head of *Xylophis perroteti.*

pierced between two small nasals; a pair of small internasals; a loreal; no præocular. Body cylindrical; scales smooth, without apical pits, in 13 or 15 rows; tail short, subcaudals in two rows.

Distribution. Two species, from the hills of Southern India.

Synopsis of the Species.

Scales in 13 rows; supraocular larger than postocular	*X. perroteti,* p. 283.
Scales in 15 rows; supraocular not larger than postocular	*X. stenorhynchus,* [p. 284.

334. Xylophis perroteti.

Platypteryx perroteti, *Dum. & Bibr. Erp. Gén.* vii, p. 501; *Jan, Icon. Ophid.* 12, pl. i, fig. 1.
Rhabdosoma microcephalum, *Günth. Cat. Col. Sn.* p. 12.
Geophis microcephalus, *Günth. Rept. B. I.* p. 200, pl. xviii, fig. A; *Theob. Cat.* p. 142.

Rostral small, deeper than broad, just visible from above; suture between the internasals one third to one half the length of that between the præfrontals; frontal as long as broad or slightly longer than broad, nearly as long as its distance from the end of the snout and two thirds or three fifths the length of the parietals; supraocular small, but yet much larger than the single postocular; loreal much elongate and usually entering the eye; in some specimens, however, the præfrontal forms a short suture with the third labial, in front of the eye; six upper labials, third and fourth entering the eye, first very small, fifth largest; temporals 1+2; four lower labials in contact with the chin-shields, which are very large and in contact with the mental; no posterior chin-shields. Scales in 13 rows. Ventrals 130–147; anal single;

* The name *Platypteryx*, Dum. & Bibr. (1854), is preoccupied (Laspeyres, 1803).

subcaudals 17–38. Brown above, spotted with black, or with more or less distinct black longitudinal bands; sometimes an ill-defined yellow collar; lips black and yellow; lower surface black and white, or grey spotted with black, or nearly uniform brownish black.

Total length 25 inches; tail 1·5.

Hab. Hills of Southern India up to 5000 feet.

335. Xylophis stenorhynchus.

Geophis stenorhynchus, *Günth. P. Z. S.* 1875, p. 230.
Xylophis indicus, *Beddome, P. Z. S.* 1878, p. 576.

Rostral small, deeper than broad, well visible from above; suture between the internasals about one third the length of that between the præfrontals; frontal as long as broad or slightly longer than broad, nearly as long as its distance from the end of the snout, and a little shorter than the parietals; suture between the latter shields much shorter than the frontal; supraocular very small, not larger than the single postocular; loreal much elongate, entering the eye; temporals 1+2; 5 upper labials, third and fourth entering the eye, first very small, fifth largest; 4 lower labials in contact with the chin-shields, which are very large and in contact with the mental; no posterior chin-shields. Scales in 15 rows. Ventrals 120–131; anal single; subcaudals 17–31. Dark brown above, uniform or with three rather indistinct darker longitudinal lines, and a yellowish collar; lower surface uniform dark brown.

Total length 9 inches; tail 8·1.

Hab. Travancore and Madura Hills (5000 feet).

Genus TRACHISCHIUM,

Günther, Cat. Col. Sn. p. 30, 1858.

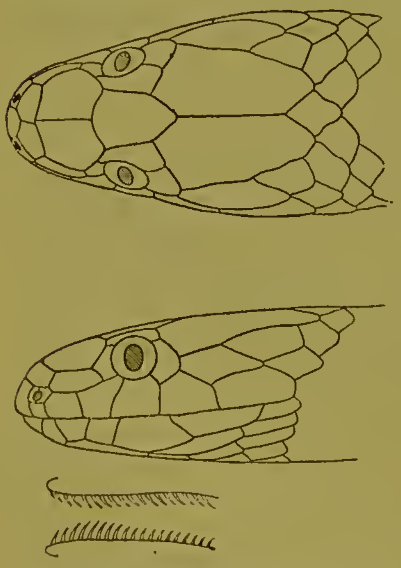

Fig. 91.—Head and dentition of *Trachischium fuscum*.

Maxillary teeth 18 to 20, anterior shortest; posterior mandibular teeth shorter than the anterior. Head not distinct from neck; eye small, with vertically subelliptic pupil; nostril between two very small nasals; head-shields normal, præfrontals sometimes united. Body cylindrical; scales smooth, without apical pits, in 13 or 15 rows; tail short; subcaudals in two rows.

Distribution. Eastern Himalayas and Khási Hills.

Four or five species are known, all of small size. Their correct position in the system is evidently near *Xylophis* and *Brachyorrhos*, with which they have much in common.

Synopsis of the Species.

A. Scales in 13 rows, those of the ischiadic region keeled in the males.	
a. Præfrontal shield usually undivided; one postocular; 150 ventrals or more	*T. fuscum*, p. 285.
b. Præfrontal shield usually undivided; one postocular: 134–145 ventrals	*T. guentheri*, p. 285.
c. Two præfrontals; two postoculars	*T. tenuiceps*, p. 286.
B. Scales in 15 rows, all smooth.	
a. Sixth upper labial largest	*T. monticola*, p. 286.
b. Last three upper labials subequal	*T. rubriventer*, p. 286.

336. Trachischium fuscum.

Calamaria fusca *and* C. obscuro-striata, *Blyth, J. A. S. B.* xxiii, 1854, p. 288.
Trachischium rugosum, *Günth. Cat. Col. Sn.* p. 30.
Trachischium fuscum, *Günth. P. Z. S.* 1860, p. 161; *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 45; *Anders. P. Z. S.* 1871, p. 171; *Theob. Cat.* p. 144.
Ablabes fuscus, *Günth. Rept. B. I.* p. 225.

Rostral as broad as deep or a little deeper than broad, visible from above; suture between the internasals very short; præfrontal usually single; frontal longer than its distance from the end of the snout, two thirds or three fourths the length of the parietals; loreal longer than deep; one præ- and one postocular; temporals 1+2; 6 upper labials, third and fourth entering the eye, first smallest, sixth largest; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small. Scales in 13 rows; those on the sides of the anal and basicaudal regions obtusely keeled in the male. Ventrals 150–162; anal divided; subcaudals 33–42. Dark brown or black above and below, with or without more or less indistinct lighter longitudinal streaks above.

Total length 20 inches; tail 2·5.

Hab. Eastern Himalayas (3000–7000 feet), very common in Sikhim; Khási Hills; Rangoon? (*Blyth*).

337. Trachischium guentheri.

Trachischium obscuro-striatum (*non Blyth*), *Günth. P. Z. S.* 1860, p. 161.

Rostral as broad as deep or a little deeper than broad, visible from above; suture between the internasals very short; præfrontal usually single; frontal longer than its distance from the end of the snout, two thirds the length of the parietals; loreal longer than deep; one præ- and one postocular; temporals 1+2; 6 upper labials, third and fourth entering the eye, first smallest, sixth largest; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small. Scales in 13 rows; male

with keeled scales in the anal and basicaudal regions. Ventrals 132–145; anal divided; subcaudals 33–38. Dark brown above, with indistinct lighter and darker longitudinal streaks; yellowish beneath, uniform or scantily mottled with brown.

Total length 11 inches; tail 1·4.

Hab. Sikhim.

338. Trachischium tenuiceps.

Calamaria tenuiceps, *Blyth, J. A. S. B.* xxiii, 1854, p. 288.
Ablabes tenuiceps, *Günth. Rept. B. I.* p. 224; *Theob. Cat.* p. 154.

Rostral a little broader than deep, visible from above: suture between the internasals about two thirds the length of that between the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal longer than deep; one præocular; two postoculars; temporals 1+1 or 1+2; 6 upper labials, third and fourth entering the eye, first smallest, sixth largest; 4 lower labials in contact with the anterior chin-shields, which are a little longer than the posterior. Scales in 13 rows; male with keeled scales in the anal and basicaudal regions. Ventrals 134–138; anal divided; subcaudals 34–39. Blackish above, yellowish beneath.

Total length 14 inches; tail 2.

Hab. Eastern Himalayas.

339. Trachischium monticola.

Calamaria monticola, *Cantor, P. Z. S.* 1839, p. 50.
Cyclophis monticola, *Günth. Rept. B. I.* p. 232; *Theob. Cat.* p. 158.
Ablabes albiventer, *Günth. P. Z. S.* 1875, p. 231.

Rostral deeper than broad, visible from above; suture between the internasals about half as long as that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep; one præocular; two postoculars, rarely one; temporals 1+1; 6 upper labials, third and fourth entering the eye, first smallest, sixth largest; 4 lower labials in contact with the anterior chin-shields, which are a little longer than the posterior. Scales in 15 rows. Ventrals 113–135; anal divided; subcaudals 28–34 (44, *Cantor*). Dark brown above, with two more or less distinct pale brown longitudinal bands edged on each side with a black line; yellowish below; young with an interrupted yellow collar.

Total length 9 inches; tail 1·2.

Hab. Darjeeling, Nága Hills, Assam.

340. Trachischium ? rubriventer.

Cyclophis rubriventer, *Jerdon, P. A. S. B.* 1870, p. 80; *Theob. Cat.* p. 159.

One præ- and two postoculars; 6 upper labials, the last three

subequal in size; temporals 1+1. Scales in 15 rows. Ventrals 127–135; subcaudals 33–38. Brown, with a pale lateral band from the eye to the tip of the tail; below this, a mottled brown and yellowish band; chin, throat, and anterior part of neck yellow, the rest of the lower parts red.

Total length 7·75 inches; tail 1·25.

Hab. Khási Hills. (Unknown to me.)

Genus **BLYTHIA**,

Theobald, Cat. Rept. As. Soc. Mus. p. 44, 1868.

Maxillary teeth about 20, anterior shortest; posterior mandibular teeth much shorter than the anterior. Head not distinct from neck; eye small, with vertically subelliptic pupil; nostril

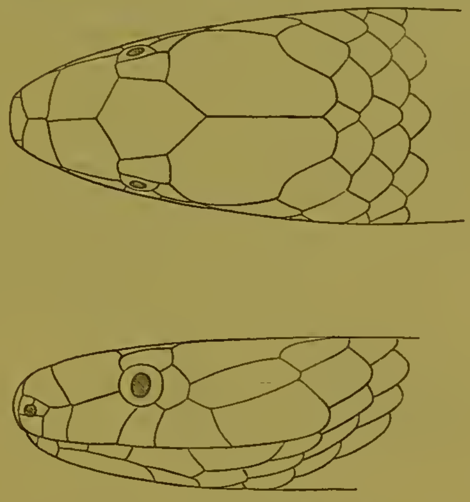

Fig. 92.—Head of *Blythia reticulata.*

between two very small nasals and the first labial; no loreal or præocular. Body cylindrical; scales smooth, without apical pits, in 13 rows; tail short; subcaudals in two rows.

A single species, from the Khási Hills.

This genus is nearly equally related to *Trachischium* and *Aspidura.*

341. Blythia reticulata.

Calamaria reticulata, *Blyth, J. A. S. B.* xxiii, 1854, p. 287.
Blythia reticulata, *Theob. Cat. Rept. As. Soc. Mus.* p. 44; *id. Cat.* p. 142.

Rostral about as broad as deep, visible from above; suture between the internasals one half to two thirds as long as that between the præfrontals; frontal longer than its distance from the end of the snout, about two thirds the length of the parietals; one postocular and one elongate temporal; 6 upper labials, third and

fourth entering the eye, first smallest, sixth largest; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small. Scales in 13 rows. Ventrals 127–150; anal divided; subcaudals 19–29. Blackish brown above and below, the lateral scales and the ventrals edged with lighter.

Total length 16·5 inches; tail 1·65.

Hab. Khási Hills.

Genus **ASPIDURA**,

Wagler, Syst. Amph. p. 191, 1830.

Maxillary teeth about 20, small, equal; posterior mandibular teeth a little shorter than the anterior. Head not distinct from neck; eye small, with round pupil; nostril between two very small

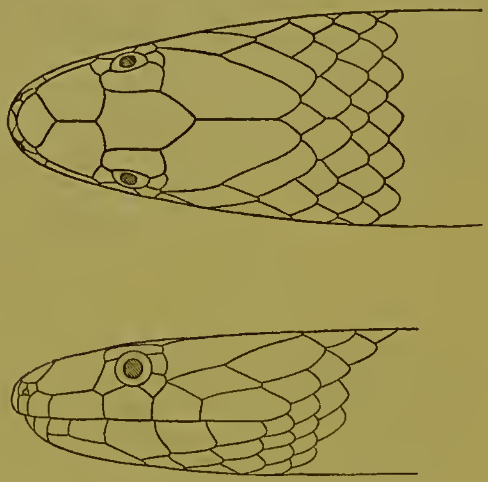

Fig. 93.—Head of *Aspidura brachyorrhos*.

nasals and the first labial; no loreal; a single internasal; præocular present or absent. Body cylindrical; scales smooth, without apical pits, in 15 or 17 rows; tail short; subcaudals simple.

Distribution. Ceylon.

Synopsis of the Species.

A. Scales in 17 rows.
  a. Both postoculars in contact with parietal; ventrals 125–150.
    a'. A præocular; supraocular more than half length of frontal . . . . *A. brachyorrhos*, p. 289.
    b'. No præocular; supraocular not half length of frontal . . . . *A. copii*, p. 289.
  b. Only upper postocular in contact with parietal; ventrals 106–111 . . . . *A. guentheri*, p. 290.
B. Scales in 15 rows . . . . *A. trachyprocta*, p. 290.

342. Aspidura brachyorrhos.

Scytale brachyorrhos, *Boie, Isis,* 1827, p. 517.
Aspidura scytale, *Dum. & Bibr. Erp. Gén.* vii, p. 128.
Aspidura brachyorrhos, part., *Günth. Cat. Col. Sn.* p. 14.
Aspidura scytale, part., *Jan, Icon. Ophid.* 13, pl. ii, fig. 2.
Aspidura brachyorrhos, *Günth. Rept. B. I.* p. 202; *Theob. Cat.* p. 142.

Rostral small, deeper than broad, scarcely visible from above; frontal a little longer than its distance from the end of the snout, two thirds the length of the parietals; supraocular more than half the length of the frontal; præfrontals in contact with the second and third upper labials, separated from the eye by a præocular; two postoculars, lower the larger, both in contact with the parietal; temporals 1+2; 6 upper labials, first smallest, sixth largest, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small and scale-like. Scales in 17 rows, all perfectly smooth. Ventrals 139–154; anal entire; subcaudals 27–38. Pale yellowish or reddish brown above, with four more or less indistinct darker longitudinal streaks and a vertebral series of blackish dots; an oblique blackish cross-band on each side of the nape; belly uniform yellowish, tail more or less abundantly freckled with brown.

Total length 14·5 inches; tail 1·65.

Hab. Ceylon; found only in the mountains.

343. Aspidura copii.

Aspidura copii, *Günth. Rept. B. I.* p. 203, pl. xviii, fig. E; *Theob. Cat.* p. 143.

Rostral small, deeper than broad, not visible from above; frontal a little longer than its distance from the end of the snout, three fifths the length of the parietals; supraocular very small, not half the length of the frontal; præfrontals in contact with the second, third, and fourth upper labials and with the eye; no præocular; two postoculars, lower the larger, both in contact with the parietal; temporals 1+2; 6 upper labials, first smallest, sixth largest, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields (which, in the type specimen, happen to be divided into two pairs); posterior chin-shields small and scale-like. Scales in 17 rows, those on the sides of the anal region and on the tail keeled in the male. Ventrals 125–150; anal undivided; subcaudals 20–33. Brown above, with two longitudinal series of large, black, pale-edged spots; an oblique, black cross-band on each side of the nape; lower surface yellowish, spotted or freckled with brown.

Total length 16·5 inches; tail 2·8.

Hab. Ceylon (Districts of Dimbola and Dickoya, 4000–5000 feet).

344. Aspidura guentheri.

Aspidura guentheri, *Ferguson, P. Z. S.* 1876, p. 819.

Rostral small, deeper than broad, not visible from above; frontal as long as or slightly longer than its distance from the end of the snout, two thirds the length of the parietals; supraocular about half the length of the frontal; præfrontals in contact with the second and third upper labials, entering the eye; a præocular; two postoculars, only the upper in contact with the parietal; temporals 1+2; 6 upper labials, first and second very small, sixth largest, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small and scale-like. Scales in 17 rows, all perfectly smooth. Ventrals 101–117; anal entire; subcaudals 19–27. Dark brown above and below, back with four longitudinal series of blackish dots; head paler above; a yellow nuchal collar, interrupted in the middle and bordered with blackish posteriorly.

Total length 6 inches; tail 0·75.

Hab. Ceylon (near the coast).

345. Aspidura trachyprocta.

Aspidura trachyprocta, *Cope, Proc. Ac. Philad.* 1860, p. 75; *Günth. Rept. B. I.* p. 203, pl. xviii, fig. F; *Theob. Cat.* p. 143.

Aspidura scytale, part., *Jan, Icon. Ophid.* 13, pl. ii, figs. 1 & 3.

Rostral small, deeper than broad, not visible from above; frontal longer than its distance from the end of the snout, about two thirds the length of the parietals; supraoculars more than half the length of the frontal; præfrontals in contact with the eye and with the second and third upper labials, separated from the fourth by a small præocular; two postoculars, lower largest, both in contact with the parietal; temporals 1+2; 6 upper labials, first and second very small, sixth largest, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small and scale-like. Scales in 15 rows, tubercularly keeled on the anal and caudal regions. Ventrals 120–147; anal entire; subcaudals 13–25. Brown or blackish above, with longitudinal series of small darker spots and a dark lateral streak, which are more distinct in the young; lower surface blackish, or yellowish spotted with black.

Total length 15 inches; tail 1.

Hab. Ceylon (in the mountains).

Genus HAPLOCERCUS,

Günther, Cat. Col. Sn. p. 14, 1858.

Maxillary teeth about 10, moderately large, subequal; posterior mandibular teeth a little shorter than the anterior. Head not distinct from neck; eye rather small, with round pupil; nostril between two small nasals and the first labial; no loreal; a single

internasal. Body cylindrical; scales keeled, in 17 rows, without apical pits; subcaudals single.

Distribution. Ceylon. A single species.

346. Haplocercus ceylonensis.

Haplocercus ceylonensis, *Günth. Cat. Col. Sn.* p. 15; *id. Rept. B. I.* p. 204, pl. xviii, fig. G.
Aspidura carinata, *Jan, Icon. Ophid.* 13, pl. i, fig. 5.
Aspidura ceylonensis, *Theob. Cat.* p. 143.

Rostral a little deeper than broad, not visible from above; frontal as long as its distance from the end of the snout, three fifths the length of the parietals; præfrontals in contact with the second and third upper labials; one præ- and two postoculars; temporals 1+2; 7 upper labials, fourth, or third and fourth, entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields small, scale-like. Scales elongate, smooth on the nape, moderately keeled on the anterior half of the back, sharply keeled on the posterior half and on the tail. Ventrals 177–207; anal single; subcaudals 42–56. Brown above, with a black vertebral line, and, on each side, a series of small black spots; an oblique yellowish, black-edged band on each side of the nape; lower surface uniform yellowish.

Total length 17·5 inches; tail 2·3.

Hab. Ceylon.

Genus LYCODON,

Boie, Isis, 1826, p. 981.

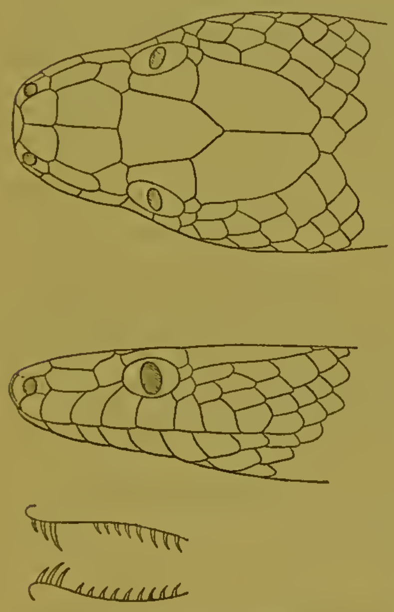

Fig. 94.—Head and dentition of *Lycodon aulicus.*

Anterior maxillary teeth enlarged, the third or fourth fang-like and followed by a toothless space; anterior mandibular teeth enlarged. Head not or but slightly distinct from neck, more or less depressed; eye small or moderate, with vertically elliptic pupil; head-shields normal. Body more or less elongate, cylindrical or slightly compressed; scales smooth or keeled, in 17 or 19 rows, with apical pits; ventrals with or without a lateral keel; subcaudals single or double.

Distribution. East Indies, Southern China, Japan, New Guinea. About 20 species are known. They feed almost exclusively on Scincoids and *Tachydromus.*

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Scales smooth, in 17 rows; subcaudals usually in two rows.
- *a.* Ventrals not angulate; snout not spatulate; anal divided.
  - *a'.* 8 upper labials . . . . *L. striatus*, p. 292.
  - *b'.* 9 or 10 upper labials . . . . *L. jara*, p. 292.
- *b.* Ventrals laterally angulate.
  - *a'.* Two loreals; snout not spatulate; anal entire; eye rather large . . . . *L. anamallensis*, [p. 293.
  - *b'.* One loreal; snout broad, much depressed, spatulate.
    - *a''.* Anal entire . . . . *L. travancoricus*, [p. 293.
    - *b''.* Anal divided . . . . *L. aulicus*, p. 294.
  - *c'.* No loreal . . . . *L. atropurpureus*, [p. 294.

B. Scales keeled.
- *a.* Scales in 17 rows.
  - *a'.* Posterior chin-shields shorter than anterior . *L. septentrionalis*, [p. 295.
  - *b'.* Posterior chin-shields longer than anterior. . *L. fasciatus*, [p. 295.
- *b.* Scales in 19 rows.
  - *a'.* Subcaudals in two rows; only scales of the 9 dorsal rows keeled . . . . *L. gammiei*, p. 296.
  - *b'.* Subcaudals single; scales strongly keeled . . *L. carinatus*, p. 296.

347. Lycodon striatus.

Russell, Ind. Serp. i, pl. xvi.
Coluber striatus, *Shaw, Zool.* iii, p. 527.
Lycodon striatus, *Günth. Rept. B. I.* p. 318; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 200; *Anders. P. Z. S.* 1871, p. 187; *Theob. Cat.* p. 199; *Murray, Zool. Sind*, p. 384.

Snout much depressed, slightly projecting; eye rather small. Rostral much broader than long, just visible from above; internasals much shorter than the præfrontals; frontal as long as its distance from the end of the snout, as long as the parietals or a little shorter; loreal elongate, not entering the eye; one præocular; two postoculars; temporals small, 1+2 or 2+2 or 2+3; eight upper labials, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are usually longer than the posterior. Scales smooth, in 17 rows. Ventrals 153–178, not angulate laterally; anal divided; subcaudals 42–62, in two rows. Dark brown or black above, with white transverse spots or cross-bands, which are widely separated anteriorly; sides lineolated with white, with a black spot corresponding to each white cross-band; upper lip and lower surface uniform white.

Total length 17 inches; tail 3.

Hab. From Sind, the Punjab, the North-Western Provinces, and the hills below Simla to Southern India.

348. Lycodon jara.

Russell, Ind. Serp. i, pl. xiv.
Coluber jara, *Shaw, Zool.* iii, p. 525.

Coluber bipunctatus, *Cantor, P. Z. S.* 1839, p. 52.
Lycodon jara, *Schleg. Phys. Serp.* ii, p. 110; *Stoliczka, J. A. S. B.* xl, 1871, p. 442; *Theob. Cat.* p. 200.
Leptorhytaon jara, *Günth. Cat. Col. Sn.* p. 205; *id. Rept. B. I.* p. 321.
Lycophidion bipunctatum, *Peters, MB. Ak. Berl.* 1863, p. 403.

Snout much depressed; eye rather small. Rostral much broader than long, just visible from above; internasals much shorter than the præfrontals; frontal as long as or a little shorter than its distance from the end of the snout, a little shorter than the parietals; loreal elongate, not entering the eye; one præocular; two postoculars; temporals small, 1+2; 9 or 10 upper labials, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 17 rows. Ventrals 167–175, not angulate laterally; anal divided; subcaudals 56–63, in two rows. Brown above, each scale with two white dots or short longitudinal lines; labials white; usually a white collar; lower surface uniform white.

Total length 16 inches; tail 2·75.

Hab. Ganjam, Bengal to base of Himalayas, Assam, Pegu; Anaimalai Hills according to Günther.

349. Lycodon anamallensis.

Lycodon anamallensis, *Günth. Rept. B. I.* p. 318; *Theob. Cat.* p. 200.

Snout moderately depressed; eye rather large. Rostral much broader than long, just visible from above; internasals much shorter than præfrontals; frontal as long as its distance from the end of the snout, slightly shorter than the parietals; two loreals; one præocular in contact with the frontal; two postoculars; temporals small, scale-like, 2+3; 9 upper labials, third, fourth, and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 17 rows. Ventrals 202, obtusely angulate laterally; anal undivided; subcaudals 74, in two rows. Brown above, with narrow white, black-edged cross-bands; labials white, each with a brown spot; lower parts uniform white.

Total length 20 inches; tail 3·5.

Hab. Anaimalai Hills, S. India. A single specimen is known.

350. Lycodon travancoricus.

Cercaspis travancoricus, *Beddome, Madras Journ. Med. Sc.* 1870; *Theob. Cat.* p. 201.

Snout much depressed, with swollen lips, subspatulate; eye rather small. Rostral much broader than long, hardly visible from above; internasals much shorter than the præfrontals; frontal as long as its distance from the end of the snout, or a little longer, a little shorter than the parietals; loreal elongate, rarely entering

the eye; one præocular, usually in contact with the frontal; two postoculars; temporals small, scale-like, 2+3 or 3+3; 9 upper labials, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 17 rows. Ventrals 178–202, obtusely angulate laterally; anal undivided; subcaudals usually in two rows, sometimes simple*, 66–76. Coloration very similar to that of *L. striatus*, viz., dark brown or black above, with white cross-bands and white lineolations on the sides, and uniform white below; but the upper lip is brown, or white spotted with brown.

Total length 2 feet; tail 5 inches.

Hab. Travancore Hills (5000 feet), Anaimalai (4700 feet), Nilgiri (5900 feet).

351. Lycodon aulicus.

Russell, Ind. Serp. ii, pl. xxxix.
Coluber aulicus, *Linn. Syst. Nat.* i, p. 381.
Lycodon aulicus, *Boie, Isis,* 1826, p. 981; *Günth. Rept. B. I.* p. 316; *id. Zool. Rec.* 1870, p. 75; *Jan, Icon. Ophid.* 36, pl. iv, fig. 1; *Theob. Cat.* p. 199; *Murray, Zool. Sind,* p. 383.
Lycodon aulicus, part., *Cantor, J. A. S. B.* xvi, 1847, p. 915.
Tytleria hypsirhinoides, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 66.

Snout much depressed, with swollen lips, spatulate in the adult; eye rather small. Rostral much broader than long, just visible from above; internasals much shorter than the præfrontals; frontal usually shorter than its distance from the end of the snout or than the parietals; loreal elongate, not entering the eye; one præocular, usually in contact with the frontal; two postoculars; temporals small, scale-like, 2+3 or 3+3; 9 upper labials, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales smooth, in 17 rows. Ventrals 183–209, obtusely angulate laterally; anal divided; subcaudals 57–77, in two rows. Coloration variable; uniform brown above, or with white transverse bands, or with white reticulation; upper lip uniform white, or with brown spots; lower parts uniform white.

Total length 25 inches; tail 4.

Hab. India and Ceylon, Himalayas, Burma, Siam, Malay Peninsula, Java, Philippines, Timor. A common snake in India.

352. Lycodon atropurpureus.

Lycodon atropurpureus, *Cantor, P. Z. S.* 1839, p. 50.
Tetragonosoma atropurpureum, *Günth. Rept. B. I.* p. 321; *Theob. Cat.* p. 200.

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* Out of 15 specimens examined, 11 have all the subcaudals paired; two have them in part simple ($4\frac{6}{6}\frac{6}{6}1$; $50\frac{1}{1}\frac{7}{7}1$); and two have them all simple. Col. Beddome mentions another specimen with $28\frac{2}{2}\frac{8}{8}1$.

No loreal, the præfrontals in contact with the labials; one præ- and two postoculars; upper labials 9, the fourth and fifth (and perhaps the third) entering the eye. Ventrals 257; subcaudals 91. Deep purple, marbled with white and black; beneath pearl-coloured.

Hab. Mergui.

This species is only known from Cantor's very short diagnosis, and Günther's notes taken from a drawing of the type specimen.

353. Lycodon septentrionalis.

Ophites septentrionalis, *Günth. P. Z. S.* 1875, p. 233.

Snout moderately depressed, not spatulate; eye rather small. Rostral much broader than deep, visible from above; internasals much shorter than the præfrontals; frontal slightly longer than broad, as long as its distance from the end of the snout, shorter than the parietals; loreal small, elongate, not entering the eye; one præ- and two postoculars; temporals 2+3; 8 upper labials, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 17 rows, those of seven middle rows feebly keeled. Ventrals 214, angulate laterally; anal entire; subcaudals 83, in two rows. Black above and on the sides, with narrow whitish transverse bands, forming complete annuli on the tail, the lower surface of which is dark brown; belly whitish, with a few scattered small brown spots posteriorly.

Total length 3 feet *; tail 8 inches.

Hab. The exact habitat of this species is not known, but is probably the Himalayas or the Khási Hills. The single specimen known was obtained by Dr. Jerdon during his last journey through the northern parts of India.

354. Lycodon fasciatus.

Ophites fasciatus, *Anders. An. Zool. Res. Yunnan*, p. 827, pl. lxxviii, fig. 1.

Head flat, snout rather spatulate; eye small. Frontal nearly as broad as long; loreal long and tapering to a point posteriorly, and entering the eye; one præocular; two postoculars; temporals 2+3; 8 upper labials, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are much shorter than the posterior; 17 rows of feebly keeled scales, the keels becoming more pronounced posteriorly. Ventrals 213; anal entire; subcaudals 90, in two rows. Body encircled by broad purplish-black bands separated by reddish intervals about half their breadth; the first black band does not encircle the neck; upper labials yellowish with dusky sutures.

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* "83 inches long" in Dr. Günther's description is evidently a misprint for "33 inches long.".

Total length 21 inches; tail 4·3.

Hab. Ponsee, Western Yunnan (*Anderson*); a second specimen was obtained in the Kakhyen Hills by M. Fea.

355. Lycodon gammiei.

Ophites gammiei, *Blanf. J. A. S. B.* xlvii, 1878, p. 130.

Head flat; eye small. Body slender, compressed. Rostral about as broad as high; internasals much smaller than the præfrontals; frontal very little longer than broad, with convex sides; loreal small, elongate; one præocular; two postoculars; temporals irregular; 8 upper labials, third, fourth, and fifth entering the eye; two elongate chin-shields of about equal length, the anterior in contact with 5 lower labials. Scales in 19 rows, the nine dorsal rows keeled, five rows at each side smooth. Ventrals 214, bluntly angulate at the sides; anal entire; subcaudals 101 pairs. Body surrounded by alternating dusky and light rings with very irregular crooked margins; head above dusky olivaceous with pale spots in the middle of most of the shields; an imperfect pale collar behind the head; lower surface of head and neck whitish.

Total length 31·5 inches; tail 7.

Hab. Sikhim.

Known from a single example, which I have not seen.

356. Lycodon carinatus.

Hurria carinata, *Kuhl, Beitr. Zool. Vergl. Anat.* p. 95.
Lycodon carinatus, *Schleg. Phys. Serp.* ii, p. 109, pl. iv, figs. 6 & 7.
Cercaspis carinatus, *Dum. & Bibr. Erp. Gén.* vii, p. 390; *Günth. Rept. B. I.* p. 324; *Jan, Icon. Ophid.* 36, pl. vi, fig. 1; *Theob. Cat.* p. 201.

Snout much depressed, broad but not spatulate; eye rather small. Rostral much broader than deep, visible from above; internasals much shorter than the præfrontals; frontal slightly longer than broad, as long as its distance from the end of the snout, shorter than the parietals; loreal elongate, not entering the eye; one præ- and two postoculars; temporals 2+3; 9 upper labials, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 19 rows, strongly keeled. Ventrals 188–195, angulate laterally; anal entire; subcaudals 53–64, in a single row. Black, encircled by white rings which are broader on the belly than on the back; these annuli are broader in the young, the back of the head of which is white.

Total length 26 inches; tail 5.

Hab. Ceylon.

The following species rests only upon Cantor's diagnosis:—

Lycodon subfuscus, Cantor, P. Z. S. 1839, p. 50.

"Light brown; yellowish white beneath. Ventrals 245; subcaudals 78."

Bengal.

Hurriah sanguiventer, Cantor, t. c. p. 52, is also probably a *Lycodon*.

"Claret-purple above, with metallic lustre; blood-coloured beneath. Ventrals 207; subcaudals 99, the 14 anterior of which are entire." See Günther, Rept. B. I. p. 222, fig.

Valley of Nepal.

Genus HYDROPHOBUS,

Günth. A. M. N. H. (3) ix, 1862, p. 127 *.

Maxillary teeth 8 to 10, increasing in size posteriorly; anterior mandibular teeth a little longer than the posterior. Head distinct from neck, much depressed; eye moderate or rather large, with vertically elliptical pupil; head-shields normal, but præoculars sometimes absent and the loreal usually enters the eye. Body

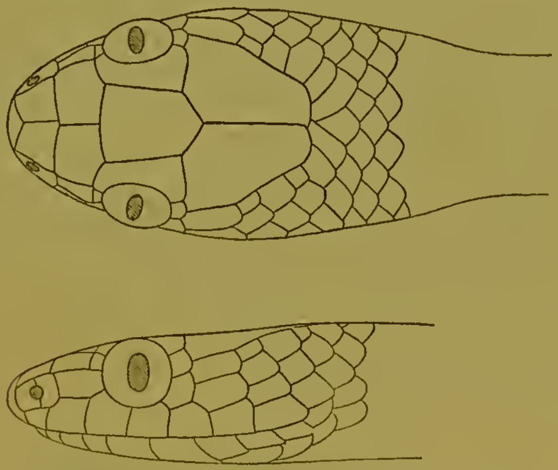

Fig. 95.—Head of *Hydrophobus nympha*.

slender, slightly compressed; scales smooth, in 13 or 15 rows, with apical pits; ventrals strongly keeled on each side; subcaudals in two rows.

This East-Indian genus, allied to *Lycodon*, comprises five species, three of which are described here. The two others are *H. subannulatus*, D. & B. (*Nymphophidium maculatum*, Gthr.), from Sumatra and Singapore, and *H. muelleri*, D. & B., from the Philippines.

* The name *Odontomus*, Dum. & Bibr. (1854), is preoccupied (Kirby, 1837).

Synopsis of Indian, Ceylonese, and Burmese Species.

Scales in 13 rows; one or two præoculars .... *H. nympha*, p. 298.
Scales in 15 rows; one præocular .... *H. gracilis*, p. 298.
Scales in 13 rows; no præocular .... *H. davisonii*, p. 299.

357. Hydrophobus nympha.

Russell, Ind. Scrp. i, pls. xxxvi, xxxvii.
Coluber nympha, *Daud. Rept.* vi, p. 244, pl. lxxv, fig. 1.
Lycodon nympha, *Boie, Isis*, 1827, p. 522.
Odontomus nympha, *Dum. & Bibr. Erp. Gén.* vii, p. 450; *Günth. Rept. B. I.* p. 233; *Jan, Icon. Ophid.* 38, pl. v, fig. 2; *Theob. Cat.* p. 160.
Hydrophobus semifasciatus, *Günth. A. M. N. H.* (3) ix, 1862, p. 127, pl. ix, fig. 6.
Odontomus semifasciatus, *Günth. Rept. B. I.* p. 234; *Theob. l. c.*
Odontomus nympha, var. ceylonensis, *F. Müll. Verh. nat. Ges. Basel*, viii, 1887, p. 269.

Rostral not twice as broad as deep, visible from above; nasal entire or divided; suture between the internasals usually as long as that between the præfrontals, or a little shorter; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep, usually entering the eye; one or two præoculars; two postoculars; temporals 2+2 or 2+3; 7 (exceptionally 8 or 6) upper labials, third and fourth entering the eye; 3 or 4 labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 13 rows. Ventrals 200–243; anal divided; subcaudals 71–88. Whitish, with or without small brown spots, and with large elliptic dark brown or black spots much longer than the interspaces between them; a large brown spot nearly covers the upper surface of the head, and is separated from the first dorsal spot by a narrow white occipital band; upper lip and lower parts uniform white.

Total length 18 inches; tail 3·5.

Hab. Southern India and Ceylon.

358. Hydrophobus gracilis.

Odontomus gracilis, *Günth. Rept. B. I.* p. 234; *Theob. Cat.* p. 160.
Odontomus fergusonii, *Haly, Taprobanian*, iii, 1888, p. 51.

Rostral twice as broad as deep, just visible from above; nasal semidivided; suture between the internasals as long as that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep, entering the eye, separated from the supraocular by a small præocular; two postoculars; temporals 2+3; 7 upper labials, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 15 rows. Ventrals 200–234; anal entire; subcaudals 75–83. Whitish, each scale brown in the centre, with large

dark brown spots separated by narrower interspaces; these brown spots much shorter, roundish, on the hinder part of the body; head dark brown above, separated from the first dorsal spot by a narrow white collar; upper lip and lower parts uniform white.

Total length 21 inches; tail 4.

Hab. Anaimalai Hills; Ceylon; Waltair, Vizagapatam, according to Elliott.

359. Hydrophobus davisonii.

Ulupe davisonii, *Blanf. J. A. S. B.* xlvii, 1878, p. 128; *id. P. Z. S.* 1881, p. 221; *Boettg. Ber. Offenb. Ver. Naturk.* 1888, p. 55.

Rostral not twice as broad as deep, visible from above; nasal undivided; suture between the internasals as long as that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep, entering the eye; no præocular; one or two postoculars; temporals 1+2 (or 2+2); seven upper labials, third and fourth entering the eye; four lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 13 rows. Ventrals 235–265; subcaudals 91–108. Above with dark brown or black elongate spots separated by white or pale brown narrower interspaces; on the hinder half of the body the brown spots become smaller or may be broken up; snout brown, connected with the first dorsal brown spot by a longitudinal brown band, the rest of the head being whitish; lower parts whitish, tail mottled with brown.

Total length 26·5 inches; tail 6.

Hab. Tenasserim, Siam, Cochin China.

Genus PSEUDOCYCLOPHIS *,

Boettger, Zool. Anz. 1888, p. 262.

Maxillary teeth 10 to 14, small and subequal; mandibular teeth subequal. Head much depressed, not distinct from neck; eye small, with vertically elliptical pupil. Body much elongate, cylindrical; scales smooth, without apical pits, in 15 or 17 rows; ventrals not keeled; subcaudals in two rows.

Four species belong to this genus, three of which occur in India; the fourth (*P. persicus*, And.) is known from Persia.

Synopsis of Indian Species.

Nostril pierced in an undivided nasal; internasals longer than præfrontals; scales in 15 rows.... *P. walteri*, p. 300.

Nasal semidivided; præfrontals longer than internasals; scales in 17 rows .... *P. olivaceus*, p. 300.

Nasal semidivided; internasal and præfrontal single; scales in 17 rows .... *P. bicolor*, p. 300.

* The name *Grotea*, Theob. (1868), is preoccupied (Cress. 1864).

360. Pseudocyclophis walteri.

Pseudocyclophis walteri, *Boettg. Zool. Anz.* 1888, p. 262, *and Zool. Jahrb.* iii, 1888, p. 922, pl. xxxiv, fig. 1.

Head much depressed; eye small. Rostral broader than deep, visible from above; nostril pierced in a single nasal; suture between the internasals longer than that between the præfrontals; frontal a little longer than broad, nearly twice as broad as the supraocular, as long as its distance from the end of the snout, and much shorter than the parietals; loreal longer than deep (if present); one præ- and one postocular; temporals 1+1; 7 upper labials, third and fourth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are a little longer than the posterior. Scales in 15 rows. Ventrals 211–231; anal divided; subcaudals 78–82. Pale olive or reddish above, anteriorly with obsolete black transverse lines, posteriorly uniform; lower parts white.

Total length 18 inches; tail 4·25.

Hab. Recently described from the Persian-Transcaspian frontier; a specimen was obtained by Mr. Blanford in the Kohistan division of the Karáchi Collectorate, Sind, and presented by him to the British Museum.

361. Pseudocyclophis olivaceus.

Ablabes olivaceus, *Beddome, Madras Journ. Med. Sc.* 1863; *Günth. Rept. B. I.* p. 227; *Theob. Cat.* p. 155.

Head much depressed; eye very small. Rostral large, twice as broad as deep, visible from above; nasal divided below the nostril; suture between the internasals shorter than that between the præfrontals; frontal only a little if at all longer than broad, three or four times as broad as the supraocular, much longer than its distance from the end of the snout and a little shorter than the parietals; loreal longer than deep; two præ- and two postoculars; temporals 1+1; 5 upper labials, third entering the eye, fifth very large; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields nearly as long as the anterior, separated from each other by two scales. Scales in 17 rows. Ventrals 206–215; anal divided; subcaudals 68–73. Dull olive-green above and below, with four longitudinal series of small black spots on the back.

Total length 21 inches; tail 3·75.

Hab. Manantoddy, Wynaad.

362. Pseudocyclophis bicolor.

Calamaria bicolor, *Blyth, J. A. S. B.* xxiii, 1854, p. 289.
Ablabes bicolor, *Günth. Rept. B. I.* p. 226; *Anders. An. Zool. Res. Yunnan,* p. 809.
Grotea bicolor, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 45; *id. Cat.* p. 145.

Head much depressed; eye very small. Rostral large, more than twice as broad as deep, just visible from above; nasal divided below the nostril; internasal single, as long as or a little shorter than the likewise single præfrontal; frontal as broad as long, as long as its distance from the end of the snout, two thirds the length of the parietals; supraocular very small; loreal as long as deep; one præocular; two postoculars; temporals 1+1; 5 upper labials, the upper angle of the third entering the eye, fifth very large; 3 lower labials in contact with the anterior chin-shields, which are not longer than the posterior. Scales in 17 rows. Ventrals 199–213; anal divided; subcaudals 58–77. Blackish brown above, brownish white below.

Total length 24 inches, tail 5.

Hab. Khási Hills, Assam, Yunnan.

Genus **POLYODONTOPHIS** *.

Teeth very numerous and closely set, equal in size, 30 to 50 in each maxillary. Dentary bone loosely attached to the articular, free posteriorly †. Head short, not or but slightly distinct from neck; eye rather small, with round pupil; head-shields normal.

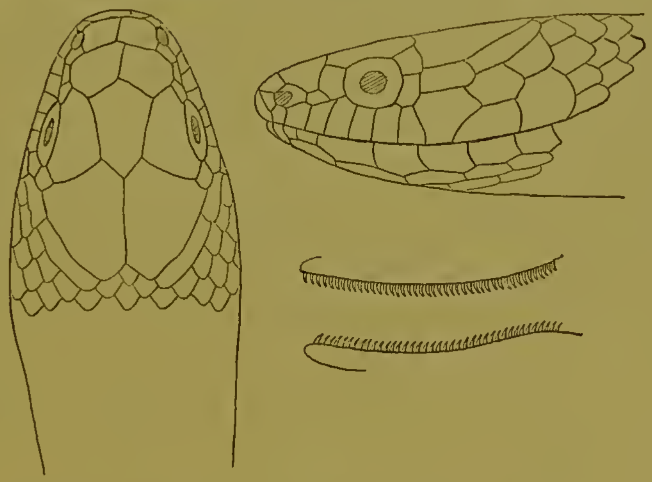

Fig. 96.—Head and dentition of *Polyodontophis collaris*.

Body cylindrical, elongate; scales smooth, without apical pits, in 17 or 19 rows; ventrals not angulate laterally; tail moderate or long; subcaudals in two rows.

This very natural genus includes 9 species: four from India, Ceylon, Burma, and Southern China, described below; one from Siam and the Malay Peninsula and Archipelago, *P. melanocephalus*, Gray (=*ornatus*, Jan), of which *Ablabes geminatus*, Schleg., and

* The name *Enicognathus*, Dum. & Bibr. (1854), is preoccupied (G. R. Gray, 1840).

† As in *Xenopeltis* (see fig. 84, p. 275), in which the teeth are likewise very numerous and closely set.

A. flaviceps, Gthr., are colour varieties; one from Madagascar, *P. rhodogaster*, Schleg. (= *Coronella torquata*, Blgr.); one from the Comoro Is., *P. comorensis*, Ptrs.; and two from Central America, *P. annulatus*, D. & B., and *sumichrasti*, Bocourt.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Upper border of rostral shield just visible from above.
  a. Subcaudals 100 or more; 10 upper labials; parietal not in contact with lower postocular .... *P. collaris*, p. 302.
  b. Subcaudals less than 80; 9 or 10 upper labials; parietal in contact with both postoculars .... *P. subpunctatus*, p. 303.
  c. Subcaudals less than 80; 7 or 8 upper labials; parietal in contact with both postoculars .... *P. sagittarius*, p. 303.

B. Portion of rostral visible from above measuring two fifths its distance from frontal; subcaudals less than 80; 9 or 10 upper labials .... *P. bistrigatus*, p. 304.

363. Polyodontophis collaris.

Psammophis collaris, *Gray, A. N. M. H.* (2) xii, 1853, p. 390.
Ablabes collaris, *Günth. Rept. B. I.* p. 228; *Stolickza, J. A. S. B.* xl, 1871, p. 430; *Anders. P. Z. S.* 1871, p. 171; *Theob. Cat.* p. 156; *Anders. An. Zool. Res. Yunnan, Rept.* p. 810.
Ablabes chinensis, *Günth. A. M. N. H.* (6) iv, 1889, p. 220.

Rostral twice as broad as deep, just visible from above; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals or shorter; loreal as long as or a little longer than deep; one præocular; two postoculars, only the upper in contact with the parietal; temporals 1 (or 2) + 2; 9 or 10 upper labials, fourth, fifth, and sixth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 17 rows. Ventrals 159–190; anal divided; subcaudals 102–131. Brown above, vertebral region greyish, usually with a series of small round black spots; head with small black spots or vermiculations above, and two black cross-bands, one across the posterior part of the frontal and supraoculars, the other across the occiput; a large black nuchal spot or cross-band, bordered with yellow posteriorly; a black line from the nostril to the nuchal spot, passing through the eye, bordering the white black-dotted upper lip. Lower parts yellowish, each ventral with an outer black spot or streak, which may be confluent on the posterior part of the body; anterior ventrals with a pair of median dots in addition.

Total length 29 inches; tail 9·5.

Hab. Himalayas (to 10,000 feet, and as far west as Simla), Assam, Arrakan, Upper Burma, S. China.

364. Polyodontophis subpunctatus.

Oligodon subpunctatum, *Dum. & Bibr. Erp. Gén.* vii, p. 58; *Jan, Icon. Ophid.* 48, pl. i, fig. 4; *Günth. Rept. B. I.* p. 208; *Theob. Cat.* p. 147.
Enicognathus melanocephalus, part., *Dum. & Bibr. t. c.* p. 330.
Calamaria sagittaria (*non Cant.*), *Jerdon, J. A. S. B.* xxii, 1853, p. 528.
Oligodon spinæ-punctatus, *Jan, Arch. Zool. Anat. Phys.* ii, 1862, p. 40; *Günth. l. c.*; *Theob. l. c.* p. 149; *F. Müller, Verh. nat. Ges. Basel,* viii, 1887, p. 262.
Enicognathus humberti, *Jan, Arch. Zool. Anat. Phys.* ii, 1863, p. 275; *id. Icon. Ophid.* 16, pl. iv, fig. 1.
Ablabes humberti, *Günth. l. c.* p. 228; *Theob. l. c.* p. 156; *Blanf. J. A. S. B.* xlviii, 1879, p. 115.

Rostral nearly twice as broad as deep; suture between the internasals a little shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals or a little shorter; loreal longer than deep; one præocular; two postoculars, both in contact with the parietal; temporals 1 (or 2) + 2; 9 or 10 upper labials, fifth and sixth, or fourth, fifth, and sixth, entering the eye; eighth upper labial usually excluded from the labial margin, simulating a lower anterior temporal; 4 lower labials in contact with the anterior chin-shields, the first usually separated from its fellow by the mental; posterior chin-shields a little longer than the anterior. Scales in 17 rows. Ventrals 151–220 (240, Blanford); anal divided; subcaudals 47–76. Pale brown above, with a vertebral series of small round black spots; usually a more or less distinct dark lateral line or series of dots; head and nape dark brown or black; lips, canthus rostralis, a transverse line between the eyes, and two broad cross-bands, one in front and one behind the nape, yellow; the dark colour often extending along the median line, bisecting the yellow collar; lower surfaces yellow, each shield with a black dot near its outer border.

From snout to vent 17 inches; tail 3·75.

Hab. India (Calcutta, Manbhoom, Ellore, Malabar) and Ceylon.

365. Polyodontophis sagittarius.

Calamaria sagittaria, *Cantor, P. Z. S.* 1839, p. 49; *id. J. A. S. B.* xvi, 1847, p. 911.
Enicognathus grayi, *Jan, Arch. Zool. Anat. Phys.* ii, 1863, p. 274; *id. Icon. Ophid.* 16, pl. iii, fig. 3.
Enicognathus braconnieri, *Jan, ll. cc.* p. 275, & fig. 4.
Ablabes sagittarius, *Günth. Rept. B. I.* p. 227; *Theob. Cat.* p. 155.

Rostral not twice as broad as deep; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal small and longer than deep, or absent; one præocular, two postoculars, both in contact with the parietal; temporals 1 + 1 or 1 + 2 + 1; 7 or 8 upper labials, third and fourth

or fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are about as large as the posterior. Scales in 17 rows. Ventrals 205–228; anal divided; subcaudals 56–70. Yellowish or pale brown above; sides brown or grey, separated from the pale dorsal region by a black line; a vertebral series of minute black dots; head and nape dark brown or black, forehead marbled with yellow, and with a large elongate oval patch of yellow on each side of the back of the head; the black nuchal spot more or less distinctly bordered with yellow behind. Lower surfaces yellow, with a black dot at the outer extremity of each ventral.

Total length 11 inches; tail 2·3.

Hab. Tirhoot in Bengal, Assam, Pinang (also Kangra, West Himalayas, according to Schlagintweit).

366. Polyodontophis bistrigatus.

Ablabes bistrigatus, *Günth. A. M. N. H.* (4) i, 1868, p. 417; *Theob. Cat.* p. 155; *Anders. An. Zool. Res. Yunnan, Rept.* p. 811.

Rostral not twice as broad as long, the portion visible from above measuring two fifths its distance from the frontal; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or longer than deep; one præocular; two postoculars, both in contact with the parietal; temporals 1 (or 2)+2; 10 upper labials, fourth, fifth, and sixth entering the eye; eighth upper labial usually excluded from the labial margin, assuming the position of a lower anterior temporal; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 17 rows. Ventrals 184–186; anal divided; subcaudals 73–75. Back ruddy brown, with a vertebral series of black dots; head and nape black, emitting a black band running on each side of the body and tail; a yellow band on each side of the head, sending off a hook on each supraciliary shield, and a pair of yellow spots on the nape. Lower surfaces uniform yellow.

Total length 12 inches; tail 3·25.

Hab. Burma (Pegu and Prome).

Genus ABLABES *,

Dum. & Bibr. Erp. Gén. vii, p. 304 (part.), 1854.

Maxillary teeth small, equal, 15 to 30; mandibular teeth subequal. Head short, not or scarcely distinct from neck; eye rather small or moderate, with round pupil; head-shields usually normal. Body cylindrical; scales smooth (or very feebly keeled), in 13 to

* *Coronella baliodira*, Schleg., is taken as the type of the genus as here restricted.

23 rows, without apical pits; ventrals not angulate laterally; tail moderate or long; subcaudals in two rows.

Distribution. South-eastern Asia. Terrestrial or subarboreal.

Cyclophis catenatus and *C.* (*Chlorophis*) *oldhami*, Theob. Cat. Rept. As. Soc. Mus. 1868, pp. 49, 50, described as from near Simla, are South-African Snakes, viz. *Homalosoma lutrix*, L., and *Ahætulla hoplogaster*, Gthr.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Eye measuring more than half length of snout.
- *a.* Nasal shield single, united with loreal; scales in 15 rows .... *A. calamaria*, p. 305.
- *b.* Nasal divided or semidivided.
  - *a'.* Scales in 13 rows .... *A. scriptus*, p. 305.
  - *b'.* Scales in 15 rows.
    - *a''.* 7 upper labials .... *A. frenatus*, p. 306.
    - *b''.* 8 upper labials .... *A. doriæ*, p. 306.

B. Eye not more than half length of snout.
- *a.* Scales in 15 rows .... *A. rappii*, p. 307.
- *b.* Scales in 17 rows .... *A. nicobariensis*, p. 307.
- *c.* Scales in 19 rows .... *A. porphyraceus*, p. 308.

367. Ablabes calamaria.

Cyclophis calamaria, *Günth. Cat. Col. Sn.* p. 250; *id. Rept. B. I.* p. 231, pl. xvii, fig. K; *Theob. Cat.* p. 158.
Homalosoma baliolum, *Jan, Icon. Ophid.* 13, pl. iv, fig. 4.
Cyclophis nasalis, *Günth. Rept. B. I.* p. 231, pl. xvii, fig. M; *Theob. l. c.* p. 158.

Rostral broader than deep, visible from above; nasal single and united with the loreal; suture between the internasals as long as that between the præfrontals or shorter; frontal longer than its distance from the end of the snout, slightly shorter than the parietals; one præocular (rarely two); two postoculars, only the upper in contact with the parietal; temporals 1+2; 7 upper labials, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are larger than the posterior. Scales in 15 rows. Ventrals 130–154; anal divided; subcaudals 64–76. Pale brown above, with or without two more or less distinct black longitudinal lines; lower parts uniform yellowish.

Total length 16 inches; tail 4·25.

Hab. Ceylon, Madras Presidency, Bombay.

368. Ablabes scriptus.

Ablabes scriptus, *Theob. Journ. Linn. Soc.* x, 1868, p. 42; *id. Cat. Rept. As. Soc. Mus.* 1868, p. 49; *id. Cat.* p. 154.

"Closely allied to *A. baliodirus*. Scales in 13 rows. Præocular one; postoculars two, small; loreal very small, much smaller than postocular; præfrontals broader than long; upper labials 8, the third, fourth, and fifth entering the orbit; a long narrow temporal, forming a suture with both postoculars and the sixth and seventh labials; seventh labial largest, more than twice as broad as the temporal; two pairs of chin-shields, the hinder rather larger than the other, first in contact with 4 labials; lower labials 7, fifth largest. Colour above brown; a few black dots on either side of spine on the front part of the trunk; a black mark under the eye, followed by a white upright border involving the postoculars; a black-bordered white patch on the last upper labial, and a white collar on the nape. Beneath white."

Hab. Martaban.

369. Ablabes frenatus.

Dipsas monticola (*non Cant.*), *Blyth, J. A. S. B.* xxiii, 1854, p. 294.
Cyclophis frenatus, *Günth. Cat. Col. Sn.* p. 120; *id. Rept. B. I.* p. 230, pl. xix, fig. J; *Jerdon, P. A. S. B.* 1870, p. 80; *Anders. P. Z. S.* 1871, p. 188; *Theob. Cat.* p. 157.

Rostral broader than deep, visible from above; nasal divided or semidivided; eye rather large, three fourths the length of the snout; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, about two thirds the length of the parietals; loreal small, as long as deep or a little longer; one præocular; two postoculars, only the upper in contact with the parietal; temporals 1+2, rarely 2+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales in 15 rows. Ventrals 151–163; anal divided; subcaudals 87–96. Olive above, the scales on the anterior part of the body black-edged; a broad black band from the eye to the nape, gradually narrowing and disappearing on the anterior fourth of the body; four light longitudinal narrow lines more or less distinct on the front half of the body; lower surface uniform yellow.

Total length 27 inches; tail 8.

Hab. Khási Hills; Assam. The habitat "Mesopotamia and Afghanistan" appears to me very doubtful.

370. Ablabes doriæ.

Cyclophiops doriæ, *Bouleng. Ann. Mus. Genova*, (2) vi, 1888, p. 599, pl. vi, fig. 1.

Snout convex, profile curved from the frontal region to the lip; rostral as deep as broad, visible from above; nostril between two nasals; internasals a little shorter than the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal small, a little longer than deep; a large præocular,

usually with a second, very small, below; two or three postoculars; temporals 1+2, or 2+2; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about half as large as the anterior. Scales in 15 rows. Ventrals 173–187; anal undivided; subcaudals 77–80. Uniform green above, white below, the green colour extending on to the ends of the ventrals.

Total length 35 inches; tail 8.

Hab. Kakhyen Hills.

371. Ablabes rappii.

Ablabes rappii, *Günth. P. Z. S.* 1860, p. 154, pl. xxvi, fig. B; *id. Rept. B. I.* p. 225; *Anders. P. Z. S.* 1871, p. 171; *Theob. Cat.* p. 154.

Ablabes owenii, *Günth. P. Z. S.* 1860, p. 155, pl. xxvi, fig. A.

Rostral twice as broad as deep, just visible from above; nostril between two nasals; suture between the internasals a little shorter than that between the præfrontals; frontal slightly shorter than its distance from the end of the snout, a little shorter than the parietals; loreal as long as deep or a little longer than deep; one præocular; two postoculars, only the upper in contact with the parietal; temporals 1+1; upper labials 6, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which equal or a little exceed the posterior in length. Scales in 15 rows. Ventrals 178–195; anal divided; subcaudals 60–75. Brown above, with a broad dark collar and a double series of transverse dark spots on the anterior part of the body; these markings most distinct in the young. Lower parts uniform yellowish.

Total length 18 inches; tail 4·5.

Hab. Himalayas from Simla to Darjeeling.

372. Ablabes nicobariensis.

Ablabes nicobariensis, *Stoliczka, J. A. S. B.* xxxix, 1870, p. 184, pl. xi, fig. 1; *Theob. Cat.* p. 157.

Rostral low, wide, not reaching the top of the head; nostril between two nasals; internasals about half the size of the præfrontals; frontal somewhat larger than the supraoculars; parietals about one fourth larger than the frontal, in contact with both postoculars; loreal united with the postnasal; one præ- and two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; both pairs of chin-shields subequal in size. Scales in 17 rows. Ventrals 189; anal divided; subcaudals 87. Anterior half of the body reddish brown above, posterior blackish grey; head above blackish, the three first labials with yellow spots; a short broad yellow streak from behind and below the eye posteriorly to the angle of the mouth; a black collar, margined on both sides with an interrupted yellow band, of which the anterior is the most

distinct; an indistinct series of blackish-grey dorsal spots, almost forming a dark undulating band; sides marbled and freckled blackish grey, this colour being separated from the upper brown one by a series of closely set black spots which are partially conspicuous on the posterior part of the body; chin dusky; lower parts yellow with a vermilion tinge, each ventral with a large black spot near its outer extremity. (*Stoliczka.*)

Total length 17·5 inches; tail 4·25.

Hab. Camorta, Nicobars.

373. Ablabes porphyraceus.

Coluber porphyraceus, *Cantor, P. Z. S.* 1839, p. 51; *Günth. Rept. B. I.* p. 239, pl. xx, fig. J; *Anders. P. Z. S.* 1871, p. 172; *Theob. Cat.* p. 163; *Anders. An. Zool. Res. Yunnan*, p. 812; *Hubrecht, Midden-Sumatra, Rept.* pl. —, fig. 1.

Psammophis nigrofasciatus, *Cantor, l. c.* p. 53.

Coronella callicephalus, *Gray, A. M. N. H.* (2) xii, 1853, p. 390; *Blyth, J. A. S. B.* xxiii, 1855, p. 289.

Snout more than twice as long as the eye, which is rather small; rostral nearly twice as broad as deep, visible from above; nostril between two nasals; suture between the internasals shorter than that between the præfrontals; frontal broad, as long as or a little longer than its distance from the end of the snout, shorter than the parietals; loreal rather small, longer than deep; a large præocular; two postoculars, both in contact with the parietal; temporals 1+2; upper labials 8, fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are longer than the posterior. Scales in 19 rows. Ventrals 192–215; anal divided; subcaudals 52–76. Pale reddish brown above, with dark brown black-edged cross-bands; a black streak along the middle of the head, and another on each side, from the eye to the first transverse band; posterior part of body and tail with two longitudinal black lines, in addition to the cross-bands; lower parts uniform yellow.

Total length 30 inches; tail 5·5.

Hab. Eastern Himalayas, hills of Assam, Northern Burma, Yunnan, Sumatra.

Genus CORONELLA,

Laurenti, Syn. Rept. p. 84, 1768.

Maxillary teeth 12 to 16, increasing in size posteriorly; mandibular teeth subequal. Head short, scarcely distinct from neck; eye rather small, with round pupil; head-shields normal. Body cylindrical; scales smooth, in 19 to 25 rows, with apical pits; ventrals rounded; tail moderate; subcaudals in two rows.

This genus is distributed over Europe, Western Asia, Africa, and America. One Indian species is referred to it. The *Coronellæ* are fierce snakes of terrestrial habits, feeding on lizards and snakes.

The Snake described by Günther as *Coronella orientalis* (Rept. B. I. p. 236) is a South-American *Liophis*, *L.* [*Ablabes*] *purpurans*, D. & B., the type of which (no. 3638) I have recently examined in the Paris Museum.

374. Coronella brachyura.

Zamenis brachyurus, *Günth. A. M. N. H.* (3) xviii, 1866, p. 27, pl. vi. fig. A; *Blanf. J. A. S. B.* xxxix, 1870, p. 372: *Anders. P. Z. S.* 1871, p. 176; *Theob. Cat.* p. 171.

Rostral broader than deep, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, a little shorter than the parietals; loreal as long as deep; one præocular; two postoculars; temporals 2+2; eight upper labials, fourth and fifth entering the eye; five lower labials in contact with the anterior chin-shields, which are slightly longer than the posterior; the latter widely separated from each other by three series of scales. Scales in 23 rows. Ventrals 213–223; anal undivided; subcaudals 43–53. Olive-brown above, with rather indistinct light variegations on the anterior half of the body; lower surface whitish.

Total length 17 inches; tail 2·2.

Hab. Deccan; the type specimen is from Poona; a second specimen was obtained by Mr. Blanford near Wun, in South-eastern Berar.

Genus SIMOTES,

Dum. & Bibr. Erp. Gén. vii, p. 624, 1854.

Maxillary teeth 8 to 12, posterior very strongly enlarged and compressed; mandibular teeth subequal. Head short, not distinct from neck; eye rather small, with round pupil; head-shields

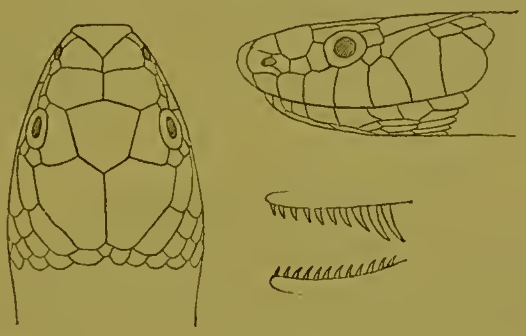

Fig. 97.—Head and dentition of *Simotes albocinctus*.

usually normal, rostral large. Body cylindrical; scales smooth (or feebly keeled), in 13 to 21 rows, with or without apical pits; ventrals rounded or obtusely keeled laterally; tail short or moderate; subcaudals in two rows.

Distribution. Southern China, East Indian Continent and Archipelago. About 20 species are known. Closely allied to *Coronella*, from which this genus is distinguished by the shorter maxillary with more strongly enlarged posterior teeth. Habits terrestrial; species of *Simotes* feed on lizards and snakes, and are of a fierce disposition.

Synopsis of Indian, Ceylonese, and Burmese Species.

- A. Anal entire.
  - *a*. 19 or 21 series of scales.
    - *a'*. Two superposed anterior temporals; usually a subocular between 3rd and 4th upper labials; 4th and 5th labials entering the eye.
      - *a''*. Four internasals; ventrals not angulate laterally .... *S. splendidus*, p. 310.
      - *b''*. Two internasals; ventrals angulate laterally .... *S. cyclurus*, p. 311.
    - *b'*. A single anterior temporal; 3rd and 4th labials entering the eye .... *S. albocinctus*, p. 312.
  - *b*. 17 series of scales.
    - *a'*. 4th and 5th upper labials entering the eye; a single anterior temporal........ *S. violaceus*, p. 312.
    - *b'*. 3rd and 4th upper labials entering the eye; 2 superposed anterior temporals.............................. *S. octolineatus*, p. 313.
- B. Anal divided.
  - *a*. 17 series of scales.
    - *a'*. Subcaudals more than 40.
      - *a''*. Nostril between two nasals; 3rd and 4th upper labials entering the eye .... *S. arnensis*, p. 314.
      - *b''*. Nasal undivided; 4th and 5th labials entering eye .... *S. beddomii*, p. 314.
    - *b'* Subcaudals less than 40.
      - *a''*. Loreal longer than posterior nasal .... *S. theobaldi*, p. 315.
      - *b''*. Loreal not longer than posterior nasal .. *S. cruentatus*, p. 315.
  - *b*. 15 series of scales .... *S. torquatus*, p. 316.
  - *c*. 13 series of scales .... *S. planiceps*, p. 316.

375. Simotes splendidus.

Simotes splendidus, *Günth. P. Z. S.* 1875, p. 231, pl. xxxiii.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal; each of the internasals broken up into two shields, there being four small shields in a transverse series; frontal longer than its distance from the end of the snout, slightly longer than the parietals; loreal deeper than long; præocular single, with a small subocular below, between the third and fourth labials; 2 or 3 postoculars; temporals 2+3; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with

the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 21 rows. Ventrals 193; anal undivided; subcaudals 41. Cream-colour, with sixteen large brown black-edged spots above, longer than the interspaces between them; these spots indented in front and behind, and with at least a trace of a yellowish median line; the anterior spot is produced angularly to the posterior border of the frontal; the rest of the upper surface of the head speckled with dark brown; tail with a yellow vertebral line; an irregular series of small blackish spots along each abdominal edge, the lower surface being otherwise immaculate.

Total length 22 inches; tail 2·5.

Hab. Wynaad. A single specimen is known.

376. Simotes cyclurus.

Coronella cyclura, *Cantor, P. Z. S.* 1839, p. 50.
Simotes bicatenatus, *Günth. Rept. B. I.* p. 217; *Theob. Journ. Linn. Soc.* x, 1868, p. 40; *Stoliczka, J. A. S. B.* xl, 1871, p. 430: *Anders. P. Z. S.* 1871, p. 170; *Theob. Cat.* p. 152.
Simotes fasciolatus, *Günth. l. c.* p. 218, pl. xx, fig. B.
Simotes cochinchinensis, *Günth. l. c.* p. 219, pl. xx, fig. C.
? Simotes obscurus, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 48.
? Simotes crassus, *Theob. l. c.* p. 48.

Nasal divided; portion of rostral seen from above nearly as long as its distance from the frontal; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, and as long as the parietals; loreal as long as deep, or a little deeper than long; præocular single, usually with a small subocular below, between the third and fourth labials; two postoculars; temporals 2+2; normally 8 upper labials, fourth and fifth entering the eye; 4, rarely 3, lower labials in contact with the anterior chin-shields; posterior chin-shields one half or two thirds the length of the anterior. Scales in 19 or 21 rows. Ventrals 156–210, angulate laterally; anal undivided; subcaudals 38–48. Pale brown or greyish above, usually with four darker brown longitudinal bands, the median pair separated by the vertebral series of scales; antero-lateral border of some of the scales frequently black; markings on the head as in *S. albocinctus*; lower surface yellowish, sometimes uniform, usually with squarish brown spots on each side below the angle of the ventrals; these blotches may be subconfluent or form two chain-like series; subcaudals unspotted or with a few small scattered dots.

Total length 28 inches; tail 4.

Hab. Bengal and Assam, to the foot of the Himalayas; Burma to the Kakhyen Hills and Tenasserim, Siam, Cochin China, and Southern China.

377. Simotes albocinctus *.

Coronella albocincta, *Cantor, P. Z. S.* 1839, p. 50.
Xenodon purpurascens, part., *Cantor, J. A. S. B.* xvi, 1847, p. 914; *Blyth, J. A. S. B.* xxiii, 1854, p. 289.
Coronella puncticulatus, *Gray, A. M. N. H.* (2) xii, 1853, p. 389.
Simotes punctulatus, *Günth. Rept. B. I.* p. 217; *Anders. P. Z. S.* 1871, p. 169; *Theob. Cat.* p. 152.
Simotes albocinctus, part., *Günth. l. c.* p. 218; *Theob. l. c.* p. 153.
Simotes amabilis, *Günth. A. M. N. H.* (4) i, 1868, p. 416, pl. xvii, fig. A; *Theob. l. c.* p. 153.

Nasal divided; portion of rostral seen from above shorter than its distance from the frontal; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep or a little longer, seldom united with the præfrontal; præocular single or (rarely) divided into two; two postoculars; temporals 1+2; normally 7 upper labials, third and fourth entering the eye; 4, rarely 5, lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 19 rows. Ventrals 177–205; anal undivided; subcaudals 53–69. Brown or brick-red above; head yellowish with a dark brown or black-edged red crescentic band across the forehead to below each eye, sometimes interrupted in the middle, an oblique one on each side from the parietal to behind the angle of the mouth, and a chevron-shaped one from the frontal to the nape, sometimes with a detached round spot in front. In the typical form, described by Cantor and by Gray, the upper parts are unspotted, with 27 to 30 (or 34) light black-edged bands two scales wide, separated by 5 to 8 series of scales; in the young specimen (type of *S. amabilis*) these bands are similar but in increased number, viz. 55, and only 3 or 4 scales apart. Other specimens are dotted and spotted with dark brown, the largest spots transversely elliptical and forming a dorsal series, or roundish and arranged in pairs; or more or less irregular narrow blackish cross-bands may be present. Lower surface yellowish or coralline-red, more or less spotted or marbled with black; in some specimens the black spots are small, squarish, far apart, and confined to the sides, whilst in others the black predominates on the belly; or the ventrals may be alternately black and yellow.

Total length 32 inches; tail 5.

Hab. Eastern and Central Himalayas (to 4000 feet); Assam; Khási and Arrakan Hills.

378. Simotes violaceus.

Coronella violacea, *Cantor, P. Z. S.* 1839, p. 50.
Simotes cinereus, *Günth. Rept. B. I.* p. 215.
Simotes swinhonis, *Günth. l. c.* p. 215, pl. xx, fig. E.

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* *Simotes albocinctus*, Dum. & Bibr. Erp. Gén. 1854 = *S. purpurascens*, Schleg. 1837

Simotes multifasciatus, *Jan, Icon. Ophid.* 12, pl. iv, fig. 2.
Simotes semifasciatus, *Anders. J. A. S. B.* xl, 1871, p. 16; *Theob. Cat.* p. 151.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal or a little shorter; suture between the internasals usually shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, as long as the parietals; loreal usually longer than deep; præocular single, usually with a small subocular below, between the third and fourth labials; one or two postoculars; temporals 1+2; upper labials 8, fourth and fifth entering the eye; 3 or 4 lower labials in contact with the anterior chin-shields; posterior chin-shields one half or less than one half the size of the anterior. Scales in 17 rows. Ventrals 160–180 (196); anal undivided; subcaudals 34–39. Pale brown, purplish or reddish above; markings on the head very indistinct; some specimens (*S. cinereus*) uniform above and below; others (*S. multifasciatus, S. semifasciatus*) with more or less distinct, narrow, broken, blackish cross-bands above, and squarish brown blotches below; a specimen from Tenasserim in the British Museum is intermediate between the two varieties.

Total length 30 inches; tail 3.

Hab. Rungpore, Bengal; Nága Hills, Assam; Tenasserim, Camboja, Southern China.

379. Simotes octolineatus.

Russell, Ind. Serp. ii, pl. xxxviii.
Elaps octolineatus, *Schneid. Hist. Amph.* ii, p. 299.
Simotes octolineatus, *Dum. & Bibr. Erp. Gén.* vii, p. 634, pl. lxxxii, fig. 3; *Jan, Icon. Ophid.* 12, pl. v, fig. 1.

Nasal divided; portion of rostral seen from above a little shorter than its distance from the frontal; suture between the internasals nearly as long as that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep; præocular single; two postoculars; temporals 2+2; upper labials 6, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 17 rows. Ventrals 165–197; anal undivided; subcaudals 51–61. Yellow with six black longitudinal stripes, or black with five yellow longitudinal lines which are much narrower than the interspaces between them; head yellow, the two median dorsal bands meeting on the frontal; a black crescentic cross-band anteriorly, passing through the eyes, and an oblique band on each side from the parietal shield to below the angle of the mouth. Lower surface uniform or with a series of black spots on each side of the ventrals, sometimes confluent into a line.

Total length 27 inches; tail 4.

Hab. Java, Borneo, Sumatra, and Malay Peninsula; a single young specimen was obtained by Col. Beddome in the Anaimalai Hills.

380. Simotes arnensis.

Russell, Ind. Serp. i, pls. xxxv & xxxviii.
Coluber arnensis, *Shaw, Zool.* iii, p. 526.
Coluber russelius, *Daud. Rept.* vi, p. 395, pl. lxxvi, fig. 2.
Coluber monticolus, *Cantor, P. Z. S.* 1839, p. 52.
Simotes russelii, *Dum. & Bibr. Erp. Gén.* vii, p. 628; *Jan, Icon. Ophid.* 11, pl. vi, fig. 1; *Günth. Rept. B. I.* p. 213; *Theob. Cat.* p. 150.
Simotes albiventer, *Günth. Rept. B. I.* p. 214, pl. xx, fig. D; *Theob. l. c.* p. 149.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal or a little shorter; suture between the internasals usually nearly as long as that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, and a little shorter than the parietals; loreal, if distinct, longer than deep, frequently united with the præfrontal; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields one half or two thirds the length of the anterior. Scales in 17 rows. Ventrals angulate laterally, 170–202; anal divided; subcaudals 41–59. Pale brown or orange above, with well-defined black cross-bands, which vary in number and in width according to individuals, and may be edged with white; an angular or transverse black band between the eyes, another behind, with the apex on the frontal, and a third on the nape. Lower surface uniform yellowish, rarely spotted with brown or with a brown posterior border to the ventrals.

Total length 24 inches; tail 3·5.

Hab. India and Ceylon, northwards to Nepal and the Himalayas, where it has been recorded from an altitude of 4100 feet.

381. Simotes beddomii.

Nasal undivided; rostral comparatively small, the portion seen from above much shorter than its distance from the frontal; suture between the internasals much shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal longer than deep; præocular single; two postoculars; temporals 1+2; upper labials 8, fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 17 rows. Ventrals 167–168; anal divided; subcaudals 43–46. Brown above, with three light longitudinal lines, intersected by dark brown transverse spots or lines; head with well-marked dark brown markings, viz. a

crescentic band anteriorly, passing through the eyes, and a chevron-shaped band behind, the apex on the frontal; each of the four anterior labials with a brown spot; a dark brown nuchal spot, angular anteriorly, divided behind by the light vertebral line. Lower surface yellowish, with very few, scattered, small brown spots; tail immaculate.

Total length 13 inches; tail 2.

Hab. Wynaad. Two specimens, obtained by Col. Beddome. Allied to *S. theobaldi*, Gthr., which it resembles strikingly in coloration.

382. Simotes theobaldi.

Simotes theobaldi, *Günth. A. M. N. H.* (4) i, 1868, p. 417; *Theob. Cat.* p. 152.

Nasal divided; portion of rostral seen from above shorter than its distance from the frontal; suture between the internasals much shorter than that between the præfrontals; frontal a little longer than its distance from the end of the snout, a little shorter than the parietals; loreal twice as long as deep, longer than the posterior nasal; præocular single; two postoculars; temporals 1+2; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 17 rows. Ventrals 174–179; anal divided; subcaudals 35. Brown above, with three light longitudinal lines between which are transverse blackish bars; head with well-marked dark markings, viz. a crescentic band anteriorly, passing through the eyes, and a chevron-shaped band behind, the apex on the frontal; a large blackish nuchal spot, partly divided by the light vertebral line. Lower surface yellowish, with or without square black spots; tail immaculate.

Total length 15 inches; tail 1·25.

Hab. Pegu, Upper Burma.

383. Simotes cruentatus.

Simotes cruentatus, *Günth. A. M. N. H.* (4) i, 1868, p. 417; *Theob. Journ. Linn. Soc.* x, 1868, p. 41; *id. Cat.* p. 151; *Stoliczka, P. A. S. B.* 1872, p. 145.

Nasal divided; portion of rostral seen from above shorter than its distance from the frontal, suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, slightly shorter than the parietals; loreal longer than deep, but shorter than in the preceding species; præocular single; two postoculars; temporals 1+2; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 17 rows. Ventrals 148–167; anal

divided; subcaudals 30–37. Brown above, with four more or less distinct darker longitudinal lines; symmetrical dark markings on head rather indistinct in the adult, an oblique spot below the eye and a large patch on the occiput being distinguishable. Lower surface yellowish (coral-red in life) with square black spots; base of tail with a large black spot.

Total length 14 inches; tail 1·75.

Hab. Pegu.

384. Simotes torquatus.

Simotes torquatus, *Bouleng. Ann. Mus. Genov.* (2) vi, 1888, p. 597, pl. v, fig. 1.

Nasal undivided; portion of rostral seen from above shorter than its distance from the frontal; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout and a little shorter than the parietals; loreal usually a little longer than deep; one præ- and two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the size of the anterior. Scales in 15 rows. Ventrals 150–159; anal divided; subcaudals 27–34. Grey-brown above, with four rather indistinct darker longitudinal streaks, replaced in the young by series of small blackish spots; upper surface of head with sometimes very indistinct symmetrical markings; a large dark brown (black in the young) spot below the eye, and a broad band of the same colour across the occiput, behind the parietal shields; lower parts white, usually with some black quadrangular spots on the posterior ventrals.

Total length 11·5 inches; tail 1·5.

Hab. Bhámo, Burma.

385. Simotes planiceps.

Simotes planiceps, *Bouleng. Ann. Mus. Genov.* (2) vi, 1888, p. 597, pl. v, fig. 2.

Head much depressed; nasal undivided; rostral very much produced posteriorly, entirely separating the internasals and wedged in between the præfrontals; frontal elongate, longer than its distance from the end of the snout and than the parietals; loreal longer than deep; one præ- and two postoculars; temporals 1+1; upper labials 5, third entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields hardly half as large as the anterior. Scales in 13 rows. Ventrals 132; anal divided; subcaudals 27. Pale brown above, with small oblique black markings occupying the anterior outer border of some of the scales; a black cross-band on the occiput, behind the parietals; upper lip yellow, with an oblique black streak below the eye, crossing the suture between the third and fourth upper labials;

lower parts pinkish, with square black spots mostly arranged in pairs.

Total length 5 inches; tail 0·6.

Hab. Minhla, Burma. Known from a single specimen.

Genus OLIGODON,

Boie, Isis, 1827, p. 519.

Characters of the preceding genus, but maxillary teeth fewer still (6 to 8), and no pterygoid teeth, the palate being entirely edentulous or with two or three teeth on each palatine. Scales in 15 or 17 rows.

Distribution. 17 species are known, viz. nine from India and Ceylon, seven from the Malay Archipelago, and one (*Oligodon* [*Homalosoma*] *melanocephalus*, Jan) from Syria and the Sinaitic Peninsula.

Synopsis of Indian and Ceylonese Species.

A. Scales in 17 rows; no loreal shield.	
a. Portion of rostral seen from above as long as its distance from frontal or a little shorter; latter shield as long as parietals	*O. venustus*, p. 317.
b. Portion of rostral seen from above as long as its distance from frontal, which is shorter than parietals	*O. travancoricus*, p. 318.
c. Portion of rostral seen from above much shorter than its distance from frontal	*O. affinis*, p. 318.
B. Scales in 15 rows.	
a. No internasals	*O. brevicauda*, p. 319.
b. A pair of internasals.	
a'. A single postocular	*O. dorsalis*, p. 319.
b'. Two postoculars.	
a''. Ventrals not more than 160; subcaudals not more than 35.	
α. Portion of rostral seen from above hardly half as long as its distance from frontal	*O. templetonii*, p. 320.
β. Portion of rostral seen from above measuring about two thirds its distance from frontal	*O. sublineatus*, p. 320.
γ. Portion of rostral seen from above as long as its distance from frontal	*O. ellioti*, p. 321.
b''. Ventrals 158 or more; subcaudals more than 35	*O. subgriseus*, p. 321.

386. Oligodon venustus.

Xenodon venustum, *Jerd. J. A. S. B.* xxii, 1853, p. 528.
Simotes venustus, *Günth. Rept. B. I.* p. 213; *id. A. M. N. H.* (4) i, 1868, p. 416; *Theob. Cat.* p. 150.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal or a little shorter; suture between the internasals shorter than that between the præfrontals; frontal

longer than its distance from the end of the snout, as long as the parietals; no loreal, the posterior nasal sometimes forming a suture with the præocular; præocular single; two postoculars; temporals 1+2; usually 7 (rarely 6) upper labials, third and fourth entering the eye, sixth frequently excluded from the labial border and taking the position of a lower anterior temporal; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields one half to two thirds the length of the anterior. Scales in 17 rows. Ventrals 143-162; anal divided; subcaudals 28-36. Pale brown or greyish above, with a series of paired large oval or rhomboidal blackish spots edged with yellowish, which are usually united mesially; a large, more irregular spot, below each dorsal spot; head-markings consisting of a crescentic anterior cross-band, passing through the eye, an oblique band on each side, from the parietal to below the angle of the mouth, and a broad angular band on the nape, top of head frequently with black vermiculations. Lower surface black and yellow, the two colours in nearly equal proportions, except under the tail, where the yellow predominates, or where sometimes black spots are entirely wanting.

Total length 19 inches; tail 2·5.

Hab. Western parts of the Madras Presidency; this species occurs in the Nilgiris up to 7000 feet.

387. Oligodon travancoricus.

Oligodon travancoricum, *Beddome, P. Z. S.* 1877, p. 685.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal; suture between the internasals shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; no loreal, the posterior nasal forming a suture with the præocular; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye, sixth excluded from the labial margin; 3 lower labials in contact with the anterior chin-shields; posterior chin-shields two thirds the length of the anterior. Scales in 17 rows. Ventrals 145; anal divided; subcaudals 37. Greyish above, with 25 black, white-edged cross-bands on the body, and five pairs of spots on the tail; three broad black white-edged transverse bands on the head, viz., a frontal, an occipital, and a nuchal, connected longitudinally on the median line; a small white spot in the middle between the parietals. Lower surface white with large square black spots.

Total length 9·5 inches; tail 1·5.

Hab. The single known specimen is from the Tinnevelly Hills, 3000 feet.

388. Oligodon affinis.

Oligodon affinis, *Günth. A. M. N. H.* (3) ix, 1862, p. 58; *id. Rept. B. I.* p. 209, pl. xix, fig. B; *Theob. Cat.* p. 149.

Nasal divided; portion of rostral seen from above half as long as its distance from the frontal; suture between the internasals as long as that between the præfrontals, or a little shorter; frontal much longer than its distance from the end of the snout, as long as the parietals; no loreal, the posterior nasal sometimes forming a suture with the præocular; præocular single; two postoculars; temporals 1+2, or 1+1+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 17 rows. Ventrals 129–142; anal divided; subcaudals 25–36. Brown above, with more or less distinct darker cross-lines; head with dark symmetrical transverse markings, which are usually connected by a median longitudinal streak. Lower surface white (in spirit) with square black spots, both colours being distributed in nearly equal proportion.

Total length 13 inches; tail 2.

Hab. Anaimalai Hills.

389. Oligodon brevicauda.

Oligodon brevicauda, *Günth. A. M. N. H.* (3) ix, 1862, p. 58; *id. Rept. B. I.* p. 211, pl. xix, fig. A; *Theob. Cat.* p. 148.

Nasal divided; portion of rostral seen from above longer than its distance from the frontal; no internasals; frontal longer than its distance from the end of the snout, as long as the parietals; no loreal, the posterior nasal forming a suture with the præocular; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 15 rows. Ventrals 173–195; anal divided; subcaudals 25–29. Brown above, with a light vertebral band, most marked posteriorly, bordered on each side by a dark brown or black band; a black narrow streak along each side; a rhomboidal dark spot on the frontal, confluent with a broad crescentic transverse band anteriorly, which passes through the eyes; a dark band from behind the eye to the angle of the mouth; a large dark nuchal spot. Lower surface red, with large quadrangular or transverse black spots; tail without, or with only a few, black spots.

Total length 18·5 inches; tail 2.

Hab. Anaimalai Hills.

390. Oligodon dorsalis.

Elaps dorsalis, *Gray, Ill. Ind. Zool.* ii, pl. lxxxv, fig. 1.
Oligodon dorsalis, *Günth. Rept. B. I.* p. 210; *Anders. P. Z. S.* 1871, p. 168; *Theob. Cat.* p. 148.

Nasal divided; portion of rostral seen from above shorter than its distance from the frontal; suture between the internasals as

long as that between the præfrontals or shorter; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep; præocular single; postocular single; temporals 1+2; upper labials 7, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 15 rows. Ventrals 174–177 (188); anal divided; subcaudals (37) 47–51. Brown above, with a yellowish vertebral streak, on each side of which is a series of small black spots; a black lateral streak; a large subtriangular blackish spot on the forehead, connected with a very large occipital spot by a longitudinal streak on the frontal. Lower surface black and yellow (in spirit), the black predominating on the belly, the yellow on the tail.

Total length 14 inches; tail 2·5.

Hab. Khási Hills.

391. Oligodon templetonii.

Oligodon templetonii, *Günth. A. M. N. H.* (3) ix, 1862, p. 57, *id. Rept. B. I.* p. 209, pl. xix, fig. C; *Theob. Cat.* p. 147.

Nasal divided; portion of rostral seen from above hardly half as long as its distance from the frontal; suture between the internasals longer than that between the præfrontals; frontal much longer than its distance from the end of the snout, as long as the parietals; loreal longer than deep, entering the eye; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye, sixth excluded from the labial border; 3 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 15 rows. Ventrals 135; anal divided; subcaudals 31. Brown above, with a yellowish vertebral streak, which becomes more distinct on the tail, and is crossed by about 18 narrow dark brown bands; head-markings very indistinct except an oblique band below the eye; lower surface white with square black spots, both colours being distributed in nearly equal proportion.

Total length 10·5 inches; tail 1·5.

Hab. Ceylon.

392. Oligodon sublineatus.

Oligodon sublineatus, *Dum. & Bibr. Erp. Gén.* vii, p. 57; *Günth. Rept. B. I.* p. 209; *Jan, Icon. Ophid.* 48, pl. i, fig. 2; *Theob. Cat.* p. 147.

Nasal divided; portion of rostral seen from above shorter than its distance from the frontal; suture between the internasals nearly as long as that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals, or slightly longer; loreal as long as deep, or a little longer, rarely absent; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 4 lower labials

in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 15 rows. Ventrals 136–159; anal divided; subcaudals 26–35. Pale brown above, some of the scales edged with dark brown; frequently a more or less regular series of paired dark brown dorsal spots; head with dark brown markings; an angular transverse band anteriorly, passing through the eyes; a longitudinal band from the middle of the frontal to a little beyond the parietals, and a large spot on each side of the nape; the longitudinal band and the nuchal spots sometimes confluent. Lower surface yellowish, with three longitudinal series of small dark brown spots, the lateral series often confluent into a line.

Total length 10 inches; tail 1·25.

Hab. Ceylon.

393. Oligodon ellioti.

Oligodon elliotti, *Günth. Rept. B. I.* p. 207, pl. xix, fig. G; *Theob. Cat.* p. 146.

Nasal divided; portion of rostral seen from above as long as its distance from the frontal; suture between the internasals as long as that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 3 lower labials in contact with the anterior chin-shields; posterior chin-shields about two thirds the length of the anterior. Scales in 15 rows. Ventrals 152; anal divided; subcaudals 29. Brown above, with a median series of large rhombic black spots, on each side of which is a small spot separated by a whitish border; head with black markings, viz. an angular band across the forehead, passing through the eyes, and a second behind, with the apex on the frontal, descending to below the angle of the mouth, and confluent with a large nuchal spot; the latter bands connected across the throat by an angular, interrupted, narrow black band. Lower surface whitish, unspotted.

Total length 11 inches; tail 1·3.

Hab. Ceylon.

394. Oligodon subgriseus.

Oligodon subgriseus, *Dum. & Bibr. Erp. Gén.* vii, p. 59; *Günth. Rept. B. I.* p. 207, pl. xix, fig. F; *Jan, Icon. Ophid.* 48, pl. i, fig. 3; *Theob. Cat.* p. 146; *Blanf. J. A. S. B.* xlviii, 1879, p. 114.
Simotes binotatus, *Dum. & Bibr. t. c.* p. 630; *Jan, Icon.* 11, pl. vi, fig. 3; *Günth. Rept. B. I.* p. 214; *Theob. Cat.* p. 150.
Xenodon dubium, *Jerdon, J. A. S. B.* xxii, 1853, p. 528.
Oligodon spilonotus, *Günth. Rept. B. I.* p. 207, pl. xix, fig. E; *Theob. Cat.* p. 146.
Oligodon fasciatus, *Günth. Rept. B. I.* p. 208, pl. xix, fig. D; *Theob. Cat.* p. 147.

Nasal divided; portion of rostral seen from above as long as, or a little shorter than, its distance from the frontal; suture between the internasals usually shorter than that between the præfrontals; frontal longer than its distance from the end of snout, as long as the parietals; loreal about as long as deep; præocular single; two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; 3 or 4 lower labials in contact with the anterior chin-shields; posterior chin-shields one half to two thirds the length of the anterior. Scales in 15 rows. Ventrals angulate laterally, 160–218; anal usually divided; subcaudals 38–56. Brown above, with a series of large rhomboidal dark spots or transverse bands, or pairs of spots, with or without a more or less distinct vertebral line; head with dark markings, viz. a crescentic band across the forehead, through the eyes, to the fourth and fifth labials, a band, widening posteriorly, from the parietals or from the frontal to the angle of the mouth, and a large spot, bifid posteriorly, from the frontal to the nape. Lower surface immaculate or with small brown spots or dots on each side.

Total length 19 inches; tail 2·5.

Hab. From Sind and Bengal to Southern India and Ceylon.

Genus LYTORHYNCHUS,

Peters, MB. Ak. Berl. 1862, p. 272.

Maxillary teeth 6 to 9, posterior much longer than anterior; mandibular teeth subequal. Head slightly distinct from neck, with cuneiform projecting snout; eye moderate, pupil vertically elliptical;

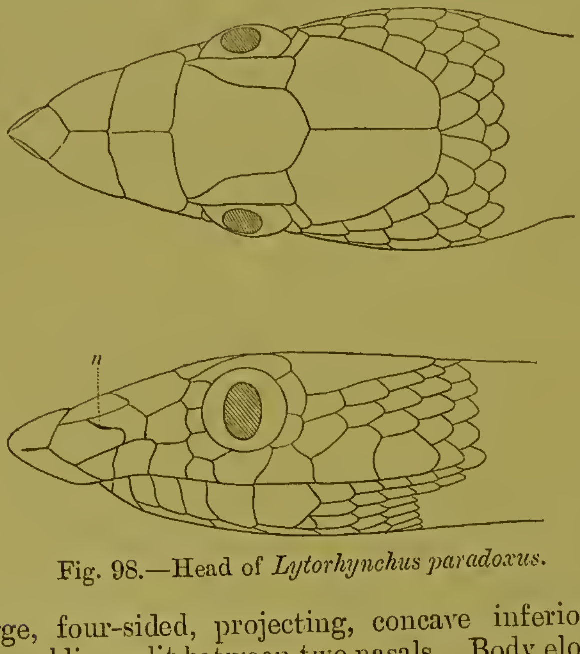

Fig. 98.—Head of *Lytorhynchus paradoxus*.

rostral large, four-sided, projecting, concave inferiorly; nostril (fig. 98, *n*) an oblique slit between two nasals. Body elongate, cylin-

drical; scales smooth, without apical pits, in 19 rows; ventrals obtusely angulate laterally; tail moderate; subcaudals in two rows.

Distribution. Three species are known: *L. diadema*, D. & B., ranging from Algeria to Persia; *L. ridgewayi*, Blgr., from Afghanistan and Turkestan; and *L. paradoxus*, Gthr., from Sind. Desert snakes, adapted for burrowing in the sand.

395. Lytorhynchus paradoxus.

Acontiophis paradoxa, *Günth. P. Z. S.* 1875, p. 232, fig.; *Murray, A. M. N. H.* (5) xiv, 1884, p. 110.

Snout long and acutely pointed; rostral with a lateral cleft; suture between the internasals shorter than that between the præfrontals and shorter than the upper part of the rostral; frontal nearly as long as its distance from the end of the snout, as long as the parietals: supraocular narrow; three præoculars; two postoculars; temporals 2+2 or 2+3; upper labials 8, fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter but much broader than the posterior. Scales in 19 rows. Ventrals slightly angulate laterally, 169–175; anal divided; subcaudals 40–53. Cream-colour above, with a dorsal series of transverse brown spots and a less distinct lateral series of smaller spots on each side; a large rhomboidal brown spot on the back of the head, and a brown band behind the eye; lower parts white.

Total length 14 inches; tail 2·3.

Hab. Sind.

Genus ZAMENIS,

Wagler, Syst. Amph. p. 188, 1830.

Maxillary teeth 12 to 20, increasing in size posteriorly; mandibular teeth subequal. Head elongate, distinct from neck; eye moderate or large, with round pupil; head-shields normal, with one or more suboculars. Body elongate, cylindrical; scales smooth or feebly keeled, with apical pits, in 15 to 31 rows; ventrals rounded or with an obtuse lateral keel; tail long; subcaudals divided.

Distribution. Europe, Asia, and North Africa. The species number about 20. As their name implies, these snakes are mostly of fierce disposition, though not always, *Z. ventrimaculatus* and especially *Z. diadema* being the reverse; they are terrestrial or subarboreal and feed principally on mammals and birds.

Synopsis of Indian Species.

A. Posterior chin-shields in contact anteriorly.
- *a.* Scales in 15 rows; ventrals 162–177 ...... *Z. korros*, p. 324.
- *b.* Scales in 17 rows; ventrals 190–208 ...... *Z. mucosus*, p. 324.

B. Posterior chin-shields separated from each other.
  a. Scales in 19 rows.
    a'. Two labials enter eye; ventrals 199–211; subcaudals 82–119 . . . . *Z. ventrimaculatus*, [p. 325.
    b'. Two labials enter eye; ventrals 214–255; subcaudals 124–140 . . . . *Z. ladacensis*, p. 326.
    c'. A subocular separates the eye from the sixth labial; ventrals 193–212; subcaudals 85–110 . . . . *Z. karelinii*, p. 326.
  b. Scales in 21 or 23 rows; two labials enter eye.
    a'. 9 upper labials; subcaudals more than 100. *Z. gracilis*, p. 327.
    b'. 8 upper labials; subcaudals less than 100. *Z. fasciolatus*, p. 327.
  c. Scales in 23 to 31 rows; eye separated from labials by a series of suboculars.
    a'. Rostral as deep as broad or a little broader than deep . . . . *Z. diadema*, p. 328.
    b'. Rostral much deeper than broad, wedged in far between the internasals . . . . *Z. arenarius*, p. 329.

396. Zamenis korros.

Coluber korros, *Schleg. Phys. Serp.* ii, p. 139; *Cantor, J. A. S. B.* xvi, 1847, p. 921.
Coryphodon korros, *Dum. & Bibr. Erp. Gén.* vii, p. 186; *Jan, Icon. Ophid.* 24, pl. iv, fig. 2.
Ptyas korros, *Cope, Proc. Ac. Philad.* 1860, p. 563; *Günth. Rept. B. I.* p. 250; *Theob. Cat.* p. 169; *Anders. An. Zool. Res. Yunnan*, p. 816.

Snout obtuse, slightly projecting; eye large; rostral a little broader than long, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little longer, and as long as the parietals; usually two or three loreals; one large præocular, with a small subocular below; two postoculars; temporals 2+2; 8 upper labials, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior; latter in contact anteriorly. Scales smooth, or feebly keeled on the posterior part of the back in the adult, in 15 rows. Ventrals 162–177; anal divided; subcaudals 129–145. Brownish or olive above, the scales on the posterior part of the body and on the tail edged with black; lower surface uniform yellow; young with transverse series of roundish pearl-coloured spots, forming cross-bands.

Total length 5 feet; tail 2 feet.

Hab. From the Sikhim Himalayas through Assam to Upper Burma, Western Yunnan, Southern China and Siam, through Arrakan and the Malay Peninsula to Sumatra and Java.

397. Zamenis mucosus.

Russell, Ind. Serp. i, pl. xxxiv, and ii, pl. xviii, fig. 2.
Coluber mucosus, *Linn. S. N.* i, p. 388.
Coluber dhumna, *Cantor, P. Z. S.* 1839, p. 51.

Coryphodon blumenbachii, *Dum. & Bibr. Erp. Gén.* vii, p. 184; *Jan, Icon. Ophid.* 24, pl. iii, figs. 2–4.
Leptophis trifrenatus, *Hallow. Proc. Ac. Philad.* 1860, p. 503.
Ptyas mucosus, *Cope, Proc. Ac. Philad.* 1860, p. 563; *Günth. Rept. B. I.* p. 249; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 185; *Blanf. J. A. S. B.* xxxix, 1870, p. 372; *Theob. Cat.* p. 168; *Anders. An. Zool. Res. Yunnan,* p. 815; *Boettg. Zool. Jahrb.* iii, 1888, p. 931.

Snout obtuse, slightly projecting; eye large; rostral a little broader than deep, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, as long as the parietals or slightly shorter; usually three loreals; one large præocular, with a small subocular below; two postoculars; temporals 2+2; 8 upper labials, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior; the latter in contact anteriorly. Scales more or less strongly keeled on the posterior part of the back, in 17 rows. Ventrals 190–208; anal divided; subcaudals 95–135. Brown above, frequently with more or less distinct black cross-bands on the posterior part of the body and on the tail; young usually with light cross-bands on the front half of the body. Lower surface yellowish; the posterior ventral and the caudal shields may be edged with black.

The largest specimen in the British Museum is 6 feet long, the tail measuring 1½ foot. Mr. Blanford records one 7 feet 7 inches long. This is commonly known in India as the rat-snake; *dhamin* in Hindi.

Hab. India and Ceylon, Afghanistan, Burma, Southern China, Siam, Malay Peninsula, Java.

398. Zamenis ventrimaculatus.

Coluber ventromaculatus, *Gray, Ill. Ind. Zool.* ii, pl. lxxx, fig. 1.
Coluber chesnei, *Martin, P. Z. S.* 1838, p. 81.
Coluber diadema (*non Schleg.*), *Blyth, J. A. S. B.* xxiii, 1854, p. 291.
Platyceps semifasciatus, *Blyth, J. A. S. B.* xxix, 1860, p. 114.
Zamenis ventrimaculatus, *Günth. Rept. B. I.* p. 253; *Stoliczka, P. A. S. B.* 1872, p. 82; *Blanf. J. A. S. B.* xliv, 1875, p. 208; *Theob. Cat.* p. 169; *Murray, Zool. Sind,* p. 378.
Zamenis persicus, *Jan, Icon. Ophid.* 23, pl. ii, fig. 1.
Coluber (Platyceps) semifasciatus, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 52.
Compsosoma semifasciata, *Stoliczka, J. A. S. B.* xxxix, 1870, p. 188, pl. xi, fig. 2; *Theob. Cat.* p. 164.
Zamenis ventrimaculatus, part., *Blanf. Zool. E. Pers.* p. 414.

Snout obtuse, feebly projecting; rostral as deep as broad or a little broader than deep, hollowed out beneath; the portion of the rostral visible from above not so long as half its distance from the frontal; suture between the internasals as long as that between the præfrontals or a little shorter; frontal as long as its distance from the end of the snout or slightly longer, shorter than the parietals; loreal usually not longer than deep; one præocular, with a small subocular below; two postoculars; temporals 2+2 or 2+3;

9 upper labials, fifth and sixth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields; posterior chin-shields as long as or longer than the anterior and separated by two series of scales. Scales perfectly smooth, in 19 rows. Ventrals 199–211; anal divided; subcaudals 82–119. Greyish or olive above, usually with more or less marked transverse dark bars which are narrower than the interspaces between them; a series of black spots on each side of the belly; a black oblique streak below the eye and another on the temple.

Total length 3 feet; tail 9 inches.

Hab. From the Euphrates through Persia, Afghanistan, and Baluchistan to Kashmir, the Punjab, Sind, Cutch, and Bombay.

399. Zamenis ladacensis.

Zamenis ladacensis, *Anders. J. A. S. B.* xl, 1871, p. 16.
Zamenis ventrimaculatus, part., *Stoliczka, P. A. S. B.* 1872, p. 130; *Blanf. Zool. E. Persia,* p. 414.

This snake, which I think it advisable to distinguish specifically from *Z. ventrimaculatus,* is recognizable by its slender form and greater number of ventrals (214 to 255) and subcaudals (124 to 140 *). In its other structural characters it agrees with *Z. ventrimaculatus.* Anterior part of body with dark cross-bands which are very close together; these disappear, or are replaced by spots posteriorly; some specimens uniform greyish olive.

Hab. The Western Himalayas (Ladák, Gilgit), and also in Persia, Arabia, Syria, and Egypt. In the latter country there also occurs the allied *Z. florulentus,* Schleg. (21 rows of scales; ventrals 201–228; subcaudals 89–98); but all the Arabian specimens I have seen (Midian, Aden, Muscat) belong to the present species.

400. Zamenis karelinii.

Coluber (Tyria) karelinii, *Brandt, Bull. Ac. St. Pétersb.* iii, 1838, p. 243.
Zamenis karelinii, *Strauch, Mém. Ac. St. Pétersb.* xxi, No. 4, p. 110, pl. iii.
Zamenis ventrimaculatus, part., *Blanf. Zool. E. Persia,* p. 414.
Zamenis ventrimaculatus, var. karelinii, *Boettg. Zool. Jahrb.* iii, 1888, p. 928.

Snout more or less pointed, projecting, with sharp canthus and nearly vertical lores; rostral as deep as broad, deeply hollowed out beneath, the portion visible from above nearly half as long as its distance from the frontal; suture between the internasals nearly as long as that between the præfrontals; frontal as long as its distance from the end of the snout, a little shorter than the parietals;

* The tail of the type specimen, described by Anderson, is probably mutilated.

oreal as deep as long or a little deeper than long; one præocular, with a small subocular below; two postoculars, with a larger subocular below; rarely a third subocular completely separates the eye from the labials; temporals 2+3; 9 upper labials, fifth normally entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields; posterior chin-shields longer than the anterior, but extremely narrow and separated from each other by two or three series of scales. Scales perfectly smooth, in 19 rows. Ventrals angulate laterally, 193–212; anal divided; subcaudals 85–110. Yellowish or pale grey above, with a dorsal series of transverse black spots or cross-bands, between each pair of which there is a black lateral spot extending on to the outer border of the ventrals; a black spot below the eye and another on the temple; lower parts white.

Total length 2 feet 5 inches; tail 7·5 inches.

Hab. Turkestan, North-eastern Persia, Afghanistan, Baluchistan.

401. Zamenis gracilis.

Zamenis gracilis, *Günth. A. M. N. H.* (3) ix, 1862, p. 125; *id. Rept. B. I.* p. 254, pl. xxi, fig. H; *Theob. Cat.* p. 170; *Murray, Zool. Sind,* p. 378.

Snout obtuse; rostral nearly as deep as broad, just visible from above; suture between the internasals a little shorter than that between the præfrontals; frontal slightly longer than its distance from the end of the snout, nearly as long as the occipitals; loreal nearly as deep as long; one præocular, with a small subocular below; two postoculars; temporals 2+2; 9 upper labials, fifth and sixth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields; posterior chin-shields as long as or longer than the anterior, separated anteriorly by two scales. Scales smooth, in 21 rows. Ventrals angulate laterally, 213–228; anal divided; subcaudals 118–121. Yellowish above, with a series of large round brown spots edged with black, separated by narrow interspaces; these spots become more indistinct on the posterior part of the body; a black cross-band on the snout and three angular dark brown black-edged bands on the head, the anterior between the eye, the posterior extending on to the nape; lower parts yellowish, with an irregular series of black spots on each side.

Total length 33 inches; tail 10.

Hab. Deccan and Sind.

402. Zamenis fasciolatus.

Russell, Ind. Serp. i, pl. xxi.

Coluber fasciolatus, *Shaw, Zool.* iii, p. 528; *Cantor, J. A. S. B.* xvi, 1847, p. 919.

Coluber curvirostris, *Cantor, P. Z. S.* 1839, p. 51.

Zamenis fasciolatus, *Günth. Rept. B. I.* p. 254, pl. xxi, fig. F; *Stoliczka, J. A. S. B.* xl, 1871, p. 431; *Theob. Cat.* p. 170.

Snout obtuse, curved and prominent; rostral large, broader than

deep, the portion visible from above more than half its distance from the frontal; suture between the internasals as long as that between the præfrontals or a little shorter; frontal nearly as long as its distance from the end of the snout, or as the parietals; loreal as long as deep or longer than deep; one præocular, usually with a small subocular below; two or three postoculars; temporals 2+2 or 2+3; upper labials 8, fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields; posterior chin-shields nearly as long as the anterior, separated from each other by two or three series of scales. Scales smooth, in 21 or 23 rows. Ventrals 197–225; anal divided; subcaudals 73–88. Yellowish or brownish olive above, with narrow white, brown, and black variegated cross bands on the anterior half of the body; these bands may entirely disappear in the adult; lower parts uniform yellowish.

Total length 3½ feet; tail 8·5 inches.

Hab. Madras Presidency, Bengal, Province Wellesley (Malay Peninsula).

403. Zamenis diadema.

Russell, Ind. Serp. ii, pl. xxx; *Geoffroy, Descr. Egypte,* pl. viii, fig. 1.
Coluber diadema, *Schleg. Phys. Serp.* ii, p. 148.
Coluber cliffordii, *Schleg. l. c.* p. 163, pl. vi, figs. 13 & 14.
Periops parallelus, *Dum. & Bibr. Erp. Gén.* vii, p. 678; *Jan, Icon. Ophid.* 20, pl. ii.
Zamenis cliffordii, *Günth. Cat. Col. Sn.* p. 104; *Blanford, P. Z. S.* 1881, p. 679.
Zamenis diadema, *Günth. Rept. B. I.* p. 252, pl. xxi, fig. G; *Anders. P. Z. S.* 1871, p. 174; *Stoliczka, P. A. S. B.* 1872, p. 82; *Theob. Cat.* p. 171; *Blanf. J. A. S. B.* xlviii, 1879, p. 125; *Murray, Zool. Sind,* p. 377.

Rostral as deep as broad or a little broader than deep, visible from above; præfrontals usually broken up into several shields, there being frequently three transverse series of shields between the rostral and the frontal; frontal as long as or slightly shorter than its distance from the end of the snout, and usually shorter than the parietals; loreals three to five; two to four (rarely one) præoculars, and three or four postoculars; a series of suboculars separate the labials from the eye; temporals small and numerous, scale-like; 10 to 13 upper labials; 5 lower labials in contact with the anterior chin-shields, which are nearly as long as the posterior. Scales usually more or less obtusely keeled, in 23 to 31 rows. Ventrals usually obtusely angulate laterally, 210–278; anal entire; subcaudals 65–110. Pale buff or sandy grey above, with more or less marked dark spots, of which the median usually form a series of rhombs; lower parts white, rarely with small blackish spots. A variety (*atriceps*, Fischer) occurs in Northern India, which is remarkable for having the head entirely or partially black above, and the body irregularly spotted or blotched with black.

Total length 6 feet; tail 13·5 inches.

Hab. North-West Provinces, Rajputana, Sind, Punjab, and Kashmir, northwards to Turkestan and westwards to the Algerian Sahara.

404. Zamenis arenarius.

Very closely allied to *Z. diadema*, but distinguished by the much larger rostral, which is considerably deeper than broad and wedged in far between the internasals; the portion of the rostral visible from above measures two thirds its distance from the frontal. Three or four præfrontals in a transverse row; frontal nearly as long as its distance from the end of the snout, shorter than the parietals; three or four loreals; two præoculars, three postoculars, and three suboculars separating the eye from the labials; temporals small, scale-like; 10 upper labials; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales obtusely keeled, in 25 to 27 rows. Ventrals not angulate laterally. Cream-colour or pale buff with darker spots disposed quincuncially, and a longitudinal streak on each side of the nape; lower parts uniform white.

The two specimens at hand consist each merely of the head and anterior part of the body, but indicate a snake four feet long. One is from Karáchi, presented by Mr. J. A. Murray; the other, labelled Sind, was found in the collection presented to the British Museum by the late Mr. F. Day.

Genus ZAOCYS,

Cope, Proc. Acad. Philad. 1860, p. 563.

Maxillary teeth 12 to 20, increasing in size posteriorly; mandibular teeth subequal. Head elongate, distinct from neck; eye rather large, with round pupil; head-shields normal, with a subocular beneath the præocular. Body elongate, compressed; scales smooth or keeled, with apical pits, in 14 or 16 rows; ventrals rounded; tail long; subcaudals divided.

Distribution. Southern China, Himalayas and Khási Hills, Upper Burma, Malay Peninsula, Borneo. Four species are distinguished.

405. Zaocys nigromarginatus.

Coluber nigromarginatus, *Blyth, J. A. S. B.* xxiii, 1854, p. 290.
Zaocys nigromarginatus, *Günth. Rept. B. I.* p. 257, pl. xxii, fig. B; *Theob. Cat.* p. 172.
Coryphodon dhumnades (*non Cant.*), *Jan, Icon. Ophid.* 24, pl. iv, fig. 1.

Rostral broader than deep, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as or a little shorter than its distance from the end of the snout or than the parietals; loreal a little longer than deep; one præocular, with a subocular beneath, wedged in between the third and fourth upper labials; two postoculars; temporals 2+2; upper

labials 8, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 16 rows, the four or six median rows keeled. Ventrals 193–205; anal divided; subcaudals 123–137. Green above, scales black-edged; yellowish green below; two broad deep-black bands along each side of the tail, advancing forwards on the trunk to its middle third in adult specimens, and nearly to the head in young ones; the two upper bands separated from each other by the joining halves of the two vertebral series of scales.

Total length 7 feet (grows to 9); tail 2 feet.

Hab. Himalayas (4000 to 7100 feet), Khási Hills, and Kakhyen Hills, Upper Burma.

Genus COLUBER*,

Linn. Syst. Nat. i, p. 375 (part.), 1766; Schleg. Phys. Serp. ii, p. 125, 1837.

Maxillary teeth 12 to 22, subequal in size; mandibular teeth subequal. Head distinct from neck, elongate; eye moderate, with round pupil; head-shields normal. Body elongate, feebly compressed; scales smooth or keeled, with apical pits, in 19 to 27 rows; ventrals usually with a more or less marked lateral keel; subcaudals double.

A large genus, distributed over the greater part of Europe, Asia, and North and Tropical America. Habits arboreal or subarboreal; fierce, and feeding chiefly on small mammals and birds.

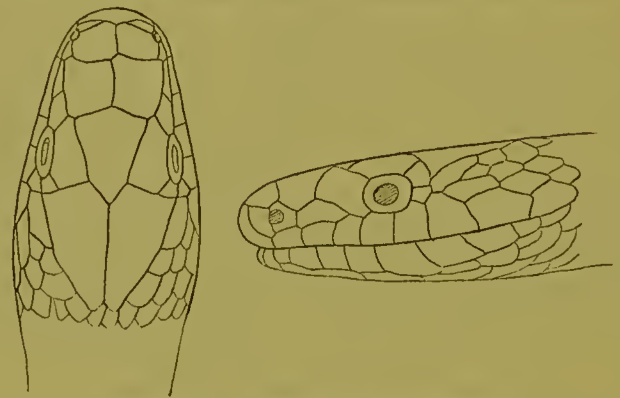

Fig. 99.—Head of *Coluber hodgsonii*.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Scales smooth or feebly keeled; ventrals without well-marked lateral keel.
  a. Anal usually single.
    a′. Scales in 23 to 27 rows .... *C. helena*, p. 331.
    b′. Scales in 19 or 21 rows .... *C. reticularis*, p. 332.

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* Includes *Elaphis, Calopeltis, Cynophis, Compsosoma, Spilotes*, and *Gonyosoma*. The species referred to *Gonyosoma* stand in the same relation to *Elaphis* and *Compsosoma* as the green *Ablabes* (*Cyclophis*), *Dipsas*, or *Trimeresurus* to the other species of those genera.

b. Anal usually divided; scales in 23 or 25 rows.
  a'. Rostral as deep as broad; normally 8 upper labials, 4th and 5th entering eye; subcaudals 79–90 .... *C. hodgsonii*, p. 332.
  b'. Rostral broader than deep; normally 9 upper labials, 5th and 6th entering eye; subcaudals 90–107.................. *C. tæniurus*, p. 333.

B. Scales strongly keeled on hinder part of back, in 19 or 21 rows; ventrals with an obtuse lateral keel.
  a'. Outer caudal scales without trace of keel. *C. radiatus*, p. 333.
  b'. All the caudal scales keeled .... *C. melanurus*, p. 334.

C. Scales smooth or feebly keeled; ventrals with well-marked lateral keel; colour uniform green.
  a'. Scales in 19 rows; loreal present ...... *C. prasinus*, p. 334.
  b'. Scales in 19 rows; no loreal .... *C. frenatus*, p. 335.
  c'. Scales in 25 or 27 rows .... *C. oxycephalus*, p. 335.

406. Coluber helena.

Russell, Ind. Serp. i, pl. xxxii.
Coluber helena, *Daud. Rept.* vi, p. 277.
Cynophis bistrigatus, *Gray, A. M. N. H.* (2) iv, 1849, p. 246.
Plagiodon helena, *Dum. & Bibr. Erp. Gén.* vii, p. 170; *Jan, Icon. Ophid.* 20, pl. iv, fig. 1.
Herpetodryas malabaricus, *Jerdon, J. A. S. B.* xxii, 1854, p. 530.
Cynophis helena, *Günth. Rept. B. I.* p. 247; *Theob. Cat.* p. 167; *Blanf. J. A. S. B.* xlviii, 1879, p. 125; *Murray, Zool. Sind*, p. 376.
Cynophis malabaricus, *Günth. Rept. B. I.* p. 248, pl. xxi, fig. A; *Theob. l. c.* p. 167.
? Coluber nuthalli, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 51; *id. Cat.* p. 164.
Cynophis malabarensis, var. carinata, *F. Müller, Verh. nat. Ges. Basel*, vi. 1878, p. 671.

Rostral a little broader than deep, visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, shorter than the parietals; loreal somewhat longer than deep; one large præocular; two postoculars; temporals 2+2 or 2+3; 9 (exceptionally 10 or 11) upper labials, fifth and sixth, or fourth, fifth, and sixth entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are as long as or a little longer than the posterior. Scales in 23 to 27 rows, smooth, or feebly keeled on the posterior part of the body and on the tail. Ventrals 220–265; anal entire; subcaudals 75–94. Young pale brown above, with black cross bands, each enclosing four to six white ocelli; adult darker brown, with transverse series of squarish black spots, or with more or less distinct traces of the livery of the young; a vertical black streak below the eye, and an oblique one

behind the eye; some specimens have a white, black-edged collar, others two black longitudinal streaks on the head; others, again, are intermediate in this respect. Lower parts yellowish, with or without a few small black spots, sometimes with a more or less distinct festooned marking on each side.

Total length 4½ feet; tail 10 inches.

Hab. Sind, Rajputana, Cutch, Bombay, and Madras Presidencies; Ceylon.

407. Coluber reticularis.

Coluber reticularis, *Cantor, P. Z. S.* 1839, p. 51.
Compsosoma reticulare, *Günth. Rept. B. I.* p. 245, pl. xxi, fig. D; *Anders. P. Z. S.* 1871, p. 172; *Theob. Cat.* p. 166.

Rostral as deep as broad or a little broader than deep, visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, as long as the parietals or a little shorter; loreal longer than deep; one large præocular, often with a small subocular below; two (exceptionally three) postoculars; temporals 2+2 or 2+3; upper labials 8, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. Scales in 19 or 21 rows, feebly keeled on the posterior part of the body. Ventrals 213–232; anal usually undivided; subcaudals 65–76. Brown above, darker behind, anteriorly with squarish dark brown spots, posteriorly with more or less distinct light cross bands; head uniform pale brown; lower surface yellowish, spotted with brown or black, or nearly uniform dark brown.

Total length 4 feet; tail 9 inches.

Hab. Eastern Himalayas (3000–4000 feet), Khási and Gáro Hills.

408. Coluber hodgsonii.

Spilotes hodgsonii, *Günth. P. Z. S.* 1860, p. 156, pl. xxvii.
Compsosoma hodgsonii, *Günth. Rept. B. I.* p. 246; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 189, and xl, 1871, p. 430; *Theob. Cat.* p. 166.

Rostral as deep as broad, visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, shorter than the parietals; loreal longer than deep, often united with the præfrontal; one large præocular (a small subocular below the præocular rarely present); two postoculars; temporals 2+2 or 2+3; normally 8 upper labials, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. Scales in 23 rows, feebly keeled on the posterior part of the body. Ventrals 233–246; anal divided; subcaudals 79–90. Brownish olive above, most of the scales black-edged; young with blackish

cross bands; lower parts yellowish, the outer part of the margin of each ventral shield blackish.

Total length 4 feet; tail 9 inches.

Hab. Himalayas, from Ladák to Sikhim.

409. Coluber tæniurus.

Elaphis tæniurus, *Cope, Proc. Ac. Philad.* 1860, p. 565; *Günth. Rept. B. I.* p. 242; *Strauch, Mém. Ac. St. Pétersb.* xxi, No. 4, p. 103; *Bouleng. A. M. N. H.* (5) xix, 1887, p. 170.

Elaphis yunnanensis, *Anders, An. Zool. Res. Yunnan,* p. 813.

Elaphis grabowskyi, *Fischer, Arch. f. Nat.* 1885, p. 59, pl. iv, fig. 3.

Rostral broader than deep, visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, as long as or a little shorter than the parietals; loreal longer than deep; one large præocular, usually with a small subocular below it; two postoculars; temporals 2+2 or 2+3; usually 9 upper labials, fifth and sixth entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. Scales in 23 or 25 rows, dorsals feebly keeled. Ventrals 230–284; anal usually divided; subcaudals 90–107. Grey-brown or olive above, head and nape uniform; a black stripe on each side of the head, passing through the eye; anterior half of back with black transverse lines or network, posterior portion with a pale vertebral stripe between two broad black ones; belly yellowish anteriorly, greyish behind; a black stripe along each side of the posterior part of the belly and along each side of the tail, separated from the upper lateral stripe by a whitish streak.

Grows to 5½ feet, the tail measuring one foot.

Hab. This snake has an extremely wide range, being on record from Mantchuria, China, Darjeeling, Cochin China, Siam, Borneo, and Sumatra.

410. Coluber radiatus.

Russell, Ind. Serp. ii, pl. xlii.

Coluber radiatus, *Schleg. Phys. Serp.* ii, p. 135, pl. v, figs. 5, 6; *Cantor, J. A. S. B.* xvi, 1847, p. 920.

Coluber quadrifasciatus, *Cantor, P. Z. S.* 1839, p. 51.

Tropidonotus quinque, *Cantor, l. c.* p. 54.

Compsosoma radiatum, *Dum. & Bibr. Erp. Gén.* vii, p. 292; *Günth. Rept. B. I.* p. 243; *Theob. Cat.* p. 165; *Anders. An. Zool. Res. Yunnan,* p. 815.

Rostral broader than deep, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little shorter, shorter than the parietals; loreal usually longer than deep; one large præocular; two postoculars; temporals usually 2+2; 8 or 9 upper labials, third to fifth, or fourth and fifth, or fourth to sixth

entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 19 or 21 rows, more or less strongly keeled on the posterior half of the body, the outer series without trace of a keel. Ventrals with an obtuse lateral keel, 224–242; anal entire; subcaudals 85–100. Yellowish brown above, with one or two black bands on each side of the anterior half of the back, the lower band usually broken up; a black line across the occiput; three black lines radiating from the eye; lower parts uniform yellow.

Total length 5 feet; tail 1 foot.

Hab. Eastern Himalayas, Assam, Burma, Cochin China, Malay Peninsula, Java, Sumatra.

411. Coluber melanurus.

Coluber melanurus, *Schleg. Phys. Serp.* ii, p. 141, pl. v, figs. 11 & 12.
Compsosoma melanurum, *Dum. & Bibr. Erp. Gén.* vii, p. 299; *Günth. Rept. B. I.* p. 244; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 188; *Theob. Cat.* p. 165.
Elaphis melanurus, *Jan, Icon. Ophid.* 21, pl. iv, fig. 1, and pl. v, fig. 1.

Rostral broader than deep, visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of the snout or a little longer, shorter than the parietals; loreal not longer than deep; one large præocular; two postoculars; temporals 2+2; upper labials 9, fourth to sixth entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 19 rows, strongly keeled; all the caudal scales keeled. Ventrals with an obtuse lateral keel, 193–230; anal entire; subcaudals 89–109. Pale brown anteriorly, with a yellow, black-edged vertebral band, which becomes gradually more and more indistinct towards the hinder part of the body, which, like the tail, is dark brown or black; a series of black spots on each side of the anterior part of the body, of ocelli with bright yellow centre in the young; some adults are nearly uniform blackish brown; a black streak below the eye, another from the eye to the commissure of the jaws, and a third along the temple and neck.

Total length 5 feet; tail 1 foot 3 inches.

Hab. Tenasserim, Andamans, Malay Peninsula and Archipelago.

412. Coluber prasinus.

Coluber prasinus, *Blyth, J. A. S. B.* xxiii, 1854, p. 291.
Gonyosoma gramineum, *Günth. Rept. B. I.* p. 294, pl. xxiii, fig. D; *Theob. Cat.* p. 190; *Anders. An. Zool. Res. Yunnan*, p. 824.

Rostral a little broader than deep, just visible from above; suture between the internasals a little shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, shorter than the parietals; loreal square or longer than

deep; one or two præoculars; temporals 1+2 or 2+2; upper labials 9, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. Scales in 19 rows, the 9 to 11 middle rows feebly keeled in the adult, smooth in the young. Ventrals with a lateral keel, 198 to 206; anal entire or divided; subcaudals 100–107. Uniform bright green above; upper lip and lower surface yellowish or greenish white.

Total length 3 feet; tail 9 inches.

Hab. Khási Hills, Assam, Upper Burma.

Except in its coloration this snake agrees so closely with *C. radiatus* and *melanurus* that I cannot regard it as generically distinct, and still less refer it to a different family.

413. Coluber frenatus.

Herpetrodryas frenatus, *Gray, A. M. N. H.* (2) xii, 1853, p. 390.
Gonyosoma frenatum, *Günth. Rept. B. I.* p. 295; *Theob. Cat.* p. 190.

Snout subacuminate, twice as long as the eye, obliquely truncated and projecting. Rostral a little broader than deep, hardly visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance from the end of the snout, shorter than the parietals; no loreal, præfrontal in contact with the labials; one large præocular; two postoculars; temporals 2+2 or 2+3; 9 (or 8) upper labials, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 19 rows, dorsals faintly keeled. Ventrals with a lateral keel, 203–204; anal divided; subcaudals 120–121. Uniform bright green above; a black streak along each side of the head, passing through the eye; upper lip and lower parts pale green, ventral keel whitish.

Total length 2 feet 9 inches; tail 9·5 inches.

Hab. Khási Hills.

414. Coluber oxycephalus.

Coluber oxycephalus, *Boie, Isis,* 1827, p. 537.
Herpetodryas oxycephalus, *Schleg. Phys. Serp.* ii, p. 189, pl. vii, figs. 8 & 9; *Cantor, J. A. S. B.* xvi, 1847, p. 927.
Alopecophis chalybeus, *Gray, A. M. N. H.* (2) iv, 1849, p. 247.
Gonyosoma oxycephalum, *Dum. & Bibr. Erp. Gén.* vii, p. 213; *Günth. Rept. B. I.* p. 294; *Jan, Icon. Ophid.* 31, pl. i; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 193, and xlii, 1873, p. 123; *Theob. Cat.* p. 189.

Snout subacuminate, more than twice as long as the eye, obliquely truncated and projecting. Rostral nearly as deep as broad, just visible from above; suture between the internasals much shorter than that between the præfrontals; frontal as long as its distance

from the end of the snout, a little shorter than the parietals; loreal very elongate; one large præocular; two postoculars; temporals 2+3; 9 or 10 upper labials, two of which (fifth and sixth or sixth and seventh) enter the eye; 6 lower labials in contact with the anterior chin-shields, which are much longer than the posterior. Scales in 25 or 27 rows, smooth or faintly keeled. Ventrals with a lateral keel, 236–263; anal divided; subcaudals 138–149. Bright green above, the scales usually finely edged with black, pale green below; a blackish streak along each side of the head, passing through the eye; tail usually yellowish brown.

Total length 7 feet 8 inches; tail 19 inches.

Hab. Tenasserim, Andamans, Nicobars, Malay Peninsula and Archipelago. Dr. Stoliczka, who observed this snake in the forests of the Andamans, says it is generally seen on bushes near brackish-water creeks, and is always ready to take to the water.

Genus XENELAPHIS.

Günther, Rept. B. I. p. 250, 1864.

Teeth subequal in size, 22 to 25 in each maxillary. Head moderately elongate, distinct from neck; eye moderate, with round pupil; head-shields normal, with a subocular below the præocular. Body elongate, cylindrical; scales smooth, without apical pits, in 17 rows, the vertebral row enlarged and six-sided. Ventrals rounded; tail long; subcaudals in two rows.

Only one species.

415. Xenelaphis hexagonotus.

Coluber hexahonotus, *Cantor, J. A. S. B.* xvi, 1847, p. 921.
Coryphodon sublutescens, *Dum. & Bibr. Erp. Gén.* vii, p. 187.
Xenelaphis hexahonotus, *Günth. Rept. B. I.* p. 258, pl. xxi, fig. C.
Ptyas hexagonotus, *Theob. Cat.* p. 168.

Rostral broader than deep, visible from above; suture between the internasals nearly as long as that between the præfrontals; frontal as long as its distance from the end of the snout, a little shorter than the parietals; loreal nearly as long as deep; one præocular, with a rather large subocular below, wedged in between the third and fourth upper labials; two postoculars, with a large subocular below, separating the eye from the fifth and sixth labials; a third subocular occasionally present, separating the eye altogether from the labials; temporals 2+2; normally 8 upper labials, fourth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 17 rows, smooth. Ventrals 185–198; anal divided; subcaudals 140–179. Brown above, with black cross bands, which become indistinct with age, on the anterior half of the body, old specimens showing mere traces of the outer ends of these bands; lower parts uniform yellowish.

Total length 5½ feet; tail 2 feet.

Hab. Arrakan, Malay Peninsula, Borneo, Sumatra, Java.

Genus DENDROPHIS,

Boie, Isis, 1827, p. 520.

Maxillary teeth 25 to 30, subequal in size; anterior mandibular teeth longest. Head distinct from neck, elongate; eye large, with round pupil; head-shields normal. Body elongate, compressed; scales smooth, with apical pits, in 13 or 15 rows, disposed obliquely, those of the median row enlarged (see fig. 88, p. 281); ventrals with suture-like lateral keel and a notch on each side corresponding to the keel; subcaudals in two rows.

Distribution. About ten species are known, from the East Indies and Northern Australia. Habits essentially arboreal.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Scales in 15 rows.
- *a.* Eye extremely large, as long as its distance from rostral shield........ *D. grandoculis*, p. 337.
- *b.* Distance between eye and rostral exceeds diameter of eye.
  - *a'.* One loreal; two or three labials enter eye .... *D. pictus*, p. 337.
  - *b'.* One loreal; a single labial enters eye; vertebral scales very little enlarged .... *D. subocularis*, p. 338.
  - *c'.* Two loreals; two labials enter the eye .... *D. bifrenalis*, p. 338.

B. Scales in 13 rows .... *D. caudolineolatus*, p. 339.

416. Dendrophis grandoculis.

Eye extremely large, as long as its distance from the rostral. Rostral much broader than long, visible from above, its upper border nearly straight; suture between the internasals as long as that between the præfrontals or a little longer; frontal as long as its distance from the end of the snout, as long as the parietals; loreal elongate; one præ- and two postoculars; temporals 2+2; upper labials 9, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 15 rows, vertebrals nearly as large as the outer row. Ventrals 174–176; anal divided; subcaudals 117. Olive-brown above, with irregular small black blotches; eye bordered with whitish; lower parts pale olive.

Total length 4 feet; tail 13½ inches.

Hab. This species was discovered by Col. Beddome in the Travancore and Tinnevelly hills, between 2000 and 3000 feet, and in the Canoot Ghat, Wynaad, at 2500 feet.

417. Dendrophis pictus.

Russell, Ind. Serp. ii, pls. xxv, & xxvi.
Coluber pictus, *Gmel. Syst. Nat.* i, p. 1116.
Dendrophis picta, *Boie, Isis,* 1827, p. 530; *Dum. & Bibr. Erp. Gén.*

vii, p. 197; *Günth. Rept. B. I.* p. 297; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 193; *Jan, Icon. Ophid.* 32, pl. i; *Theob. Cat.* p. 190.
Ahætula bellii, *Gray, Ill. Ind. Zool.* ii, pl. lxxx, fig. 2.
Dendrophis boii, *Cantor, P. Z. S.* 1839, p. 53.
Leptophis pictus, *Cantor, J. A. S. B.* xvi, 1847, p. 930.
Dendrophis picta, var. andamanensis, *Anders. P. Z. S.* 1871, p. 184.
Dendrophis picta, part., *Anders. An. Zool. Res. Yunnan*, p. 824.

Eye as long as its distance from the nostril. Rostral broader than long, visible from above, upper border forming an obtuse angle; suture between the internasals as long as that between the præfrontals or a little longer; frontal as long as its distance from the end of the snout, as long as the parietals or shorter; loreal elongate; one præocular; two or three postoculars; temporals 2+2; 9 or 10 upper labials (rarely 8), fifth and sixth, or fourth, fifth, and sixth, entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 15 rows, vertebrals at least as large as outer row. Ventrals 167–205; anal divided; subcaudals 110–150. Olive or bronze brown above, sometimes with a yellow vertebral band on the front part of the trunk; outer row of scales yellowish, between two more or less marked dark streaks; a black streak on each side of the head passing through the eye; upper lip yellow; lower parts uniform yellowish or pale greenish.

Total length 4 feet; tail 14 inches.

Hab. A widely distributed species, extending from Peninsular India and Ceylon through Bengal, Burma, and Siam to the Malay Peninsula and Archipelago.

418. Dendrophis subocularis.

Dendrophis picta, part., *Anders. An. Zool. Res. Yunnan*, p. 824.
Dendrophis subocularis, *Bouleng. Ann. Mus. Genova*, (2) vi, 1888, p. 600, pl. vi, fig. 2.

Differs from *D. pictus* in having only 8 upper labials, of which the fifth is the largest and alone borders the eye; in the scales of the vertebral row being but very feebly enlarged and smaller than those of the outer row; and in the smaller number of caudals. Ventrals 167–177; subcaudals 74–105.

Hab. Bhámo, Upper Burma.

419. Dendrophis bifrenalis.

Dendrophis picta, var. C, *Günth. Cat. Col. Sn.* p. 149.

Head more elongate than in *D. pictus*; parietals longer than the frontal; two loreals; 9 upper labials, fifth and sixth entering the eye. Scales in 15 rows, vertebrals larger than outer row. Ventrals 154–171; anal divided; subcaudals 144–155. Coloration like *D. pictus*, but the whole side of the ventrals above the lateral keel dark olive like the back.

Total length 3 feet 3 inches; tail 14·5 inches.

Hab. Ceylon. Three specimens are in the British Museum.

420. Dendrophis caudolineolatus.

Dendrophis caudolineolatus, *Günth. P. Z. S.* 1869, p. 506, pl. xl, fig. 1.
Dendrophis gregorii, *Haly, Taprobanian*, iii, 1888, p. 51.

Eye as long as its distance from the nostril. Rostral broader than long, visible from above, upper border forming an obtuse angle; suture between the internasals a little shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal elongate; one præocular; two postoculars; temporals 1+2 or 2+1; 8 or 9 upper labials, fourth and fifth, or fifth and sixth, entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 13 rows, vertebrals as large as outer row. Ventrals 149–161; anal divided; subcaudals 124–128. Bronzy olive above, anteriorly with oblique narrow black streaks; tail with four more or less distinct black lines, one above, one along the inner edges of the subcaudals, and one on each side; a black temporal streak; lower surfaces greenish white.

Total length 2 feet 1 inch; tail 9 inches.

Hab. Ceylon.

Genus DENDRELAPHIS.

Maxillary teeth 18 to 20, anterior longest; anterior mandibular teeth longest. Head distinct from neck, elongate; eye large, with round pupil; head-shields normal. Body elongate, feebly compressed; scales smooth, in 13 rows, disposed obliquely, with apical pits; ventrals with suture-like lateral keel, and a notch on each side corresponding to the keel; subcaudals in two rows.

The type species occurs in Southern India and the Malay Peninsula and Archipelago. A second species is from the Philippines, *D. terrificus*, Peters (*D. philippinensis*, Gthr.).

Of mixed arboreal and terrestrial habits.

421. Dendrelaphis caudolineatus.

Ahætula caudolineata, *Gray, Ill. Ind. Zool.* ii, pl. lxxxi.
Leptophis caudalineatus, *Cantor, J. A. S. B.* xvi, 1847, p. 932.
Dendrophis octolineata, *Dum. & Bibr. Erp. Gén.* vii, p. 201; *Jan, Icon. Ophid.* 32, pl. ii, fig. 1.
Dendrophis caudolineata, *Günth. Rept. B. I.* p. 297; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 194, & xlii, 1873, p. 123.

Snout scarcely longer than the eye. Rostral a little broader than deep, visible from above; suture between the internasals as long as or a little shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal elongate; one præ- and two postoculars; temporals 2+2; 9 upper labials, fifth and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 13 rows. Ventrals 176–

188; anal divided; subcaudals 100–112. Light brownish bronze or greenish yellow above, the scales with black edges forming more or less regular longitudinal lines; a yellowish lateral streak edged above and below by a black band, the lower of which extends on to the outer edge of the ventrals; lips and lower surfaces pale metallic citrine, the tail with a black median line.

Total length 5 feet; tail 1 foot 3 inches.

Hab. Mergui, Malay Peninsula, Borneo, Sumatra, Celebes; specimens were also obtained in the Wynaad by Col. Beddome.

This very unusual geographical distribution is not unparalleled, as we meet with the same in *Simotes octolineatus*. Special affinity between the Malay and South-Indian fauna is also exhibited in the lizards of the genera *Draco* and *Liolepis*.

Genus PSEUDOXENODON.

Maxillary teeth 20 to 25, increasing in size posteriorly, the two last abruptly enlarged; mandibular teeth subequal. Head distinct from neck, which is dilatable; eye large, with round pupil; head-shields normal. Body moderately elongate, cylindrical; scales on the anterior part of the body disposed obliquely, narrow and much imbricate, in 17 or 19 rows; dorsals keeled, without apical pits; ventrals rounded; subcaudals in two rows.

This new genus is distinguished from *Tropidonotus* by its oblique scales, and from *Xenodon*, Boie (type *X. severus*, L.), by its longer maxillary with much more numerous teeth. Besides *P. macrops*, it embraces the South-Chinese *Tropidonotus dorsalis*, Gthr., and the Javan *Xenodon inornatus*, Boie.

422. Pseudoxenodon macrops.

Tropidonotus macrops, *Blyth, J. A. S. B.* xxiii, 1855, p. 296; *Günth. Rept. B. I.* p. 263; *Stoliczka, J. A. S. B.* xl, 1871, p. 436; *Theob. Cat.* p. 174.
Xenodon macrophthalmus, part., *Günth. Cat. Col. Sn.* p. 58.
Tropidonotus macrophthalmus, part., *Günth. Rept. B. I.* p. 262, pl. xxii, fig. C.
Tropidonotus macrophthalmus, *Anders. P. Z. S.* 1871, p. 177.
Tropidonotus sikkimensis, *Anders. J. A. S. B.* xl, 1871, p. 17.

Eye large, its diameter more than its distance from the nostril; rostral just visible from above; suture between the internasals shorter than that between the præfrontals; frontal slightly shorter than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or deeper than long; one præocular; three postoculars; temporals 2+2; 8 upper labials, fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales more or less strongly keeled, in 19 rows anteriorly, in 17 on the middle of the body. Ventrals 160–173; anal divided; subcaudals 60–75. Brown or olive above, with or without a dorsal

series of reddish-brown or orange spots, and a dorso-lateral series of black spots; a more or less distinct chevron-shaped dark marking, pointing forwards, may be present on the nape; anterior part of belly with large quadrangular blackish-brown spots, posterior part and lower side of the tail clouded with brown.

Total length 39 inches; tail 7.

Hab. Eastern Himalayas (4000 feet), Khási Hills, Kakhyen Hills, and Pegu Hills.

This snake is remarkable for its dilatable neck, with the scaling very similar to that of a Cobra, for which, Dr. Günther says, it is frequently taken.

Genus TROPIDONOTUS,

Kuhl, in Férussac, Bull. Sc. Nat. ii, 1824, p. 81; Boie, Isis, 1827, p. 518.

Maxillary teeth 12 to 22, posterior longest; mandibular teeth subequal. Head distinct from neck; eye moderate or rather large,

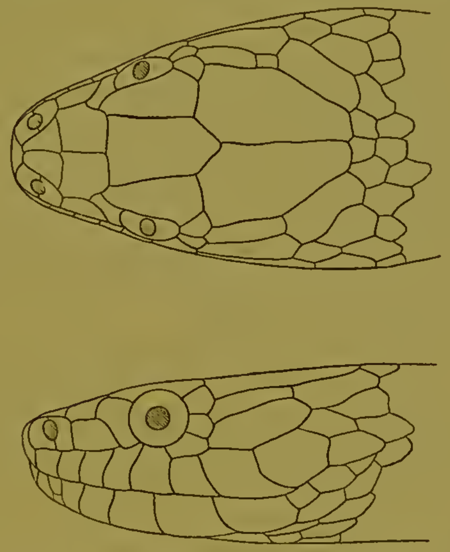

Fig. 100.—Head of *Tropidonotus piscator*.

with round pupil; head-shields normal. Body more or less elongate, cylindrical; scales keeled, rarely smooth, in 15 to 29 rows, with or without apical pits; ventrals rounded; subcaudals in two rows.

A large genus, distributed over the greater part of the Northern Hemisphere, together with the Malayan and Papuasian Islands, and North Australia; the bulk of the species inhabiting the East Indies and North America. Many of these snakes are aquatic in their habits, and the majority feed on batrachians and fishes; some are oviparous, others ovoviviparous.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. 19 rows of scales.	
a. Internasals broadly truncated anteriorly, trapezoid.	
a'. Scales faintly or feebly keeled; 3 labials entering the eye.	
a''. 154–168 ventrals; 96–122 subcaudals.	*T. modestus*, p. 343.
b''. 177–235 ventrals; 75–107 subcaudals.	*T. platyceps*, p. 343.
b'. Scales strongly keeled.	
a''. Eye moderate, diameter (in adults) nearly equalling distance from nostril; 3 labials entering eye.	
a. Scales of outer row smooth.	
α'. 150–154 ventrals; 80–100 subcaudals	*T. khasiensis*, p. 344.
β'. 131–150 ventrals; 65–75 subcaudals	*T. beddomii*, p. 344.
β. Scales of outer row keeled; 160–175 ventrals; 73–95 subcaudals. .	*T. parallelus*, p. 345.
b''. Eye large; scales of outer row keeled; 3 labials entering eye.	
α. Two anterior temporals	*T. chrysargus*, p. 345.
β. One anterior temporal	*T. nigrocinctus*, p. 346.
c''. Eye rather large, diameter exceeding distance from nostril; scales of outer row smooth or very feebly keeled.	
α. Two labials entering eye.	
α'. 133–141 ventrals; 48–54 subcaudals	*T. ceylonensis*, p. 346.
β'. 158–170 ventrals; 79–90 subcaudals	*T. himalayanus*, p. 347.
β. Three labials entering eye.	
α'. Frontal shorter than parietals; 132–166 ventrals; 68–87 subcaudals	*T. subminiatus*, p. 347.
β'. Frontal as long as parietals; 134–142 ventrals; 80–92 subcaudals.	*T. monticola*, p. 348.
b. Internasals much narrowed anteriorly, subtriangular; frontal longer than distance from end of snout, as long as parietals or slightly shorter.	
a'. Two or three labials entering eye.	
a''. Scales of outer row smooth; normally a single anterior temporal, and 3 labials entering eye	*T. stolatus*, p. 348.
b''. Scales of outer row smooth; normally 2 anterior temporals, and 2 labials entering eye	*T. piscator*, p. 349.
c''. Scales of outer row keeled; a single anterior temporal; 3 labials entering eye	*T. bellulus*, p. 350.
b'. A single labial entering eye; 2 anterior temporals	*T. sancti-johannis*, [p. 350.
B. 17 rows of scales, smooth or faintly keeled. .	*T. punctulatus*, p. 350.
C. 23–27 rows of scales	*T. plumbicolor*, p. 351.

423. Tropidonotus modestus.

Tropidonotus modestus, *Günth. P. Z. S.* 1875, p. 232; *Anders. An. Zool. Res. Yunnan*, p. 817.

Eye rather small; rostral just visible from above; suture between the internasals as long as that between the præfrontals or a little shorter; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep; one præocular (or two); two or three postoculars; temporals 1+1 (1+2 or 2+2); upper labials 9, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, feebly keeled. Ventrals 154–168; anal divided; subcaudals 96–122. Olive-brown above, with small black spots, and a more or less distinct series of small yellowish spots, or a yellowish band, along each side of the back; sutures between the labials black; lower surfaces yellowish, with a series of blackish spots on each side of the ventrals, or yellowish in the middle and blackish on the sides, or nearly entirely blackish.

Total length 2 feet; tail 7 inches.

Hab. Khási Hills and Western Yunnan.

424. Tropidonotus platyceps.

Tropidonotus platyceps, *Blyth, J. A. S. B.* xxiii, 1854, p. 297; *Günth. Rept. B. I.* p. 264, pl. xxii, fig. D; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 191; *Anders. P. Z. S.* 1871, p. 176; *Theob. Cat.* p. 174.

Herpetoreas sieboldii, *Günth. P. Z. S.* 1860, p. 156; *id. Rept. B. I.* p. 257; *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 54; *id. Cat.* p. 172.

Zamenis himalayanus, *Steindachner, Sitzb. zool.-bot. Ges. Wien*, xvii, 1867, p. 513, pl. xiii, figs. 1, 2, 3.

Eye moderate; rostral just visible from above; suture between the internasals as long as that between the præfrontals or shorter; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal longer than deep; one præocular (sometimes divided); two or three postoculars; temporals 1+1, or 1+2, or 2+2; upper labials 8, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are much shorter than the posterior. Scales in 19 rows, faintly or feebly keeled. 177–235 ventrals; anal divided; subcaudals 75–107. Olive-brown above, with small black spots; frequently two black parallel lines or an elliptic marking on the nape; a light, black-edged streak on each side of the head, or a black line from eye to gape; belly yellowish, with or without blackish dots; frequently a black line or series of elongate blackish spots along each side of the belly; lower surface of tail frequently mottled with blackish; throat sometimes black. In life, a coral-red band is said to run along the ends of the ventrals.

Total length 3 feet; tail 9 inches.

Hab. Himalayas from Kashmir to Assam (up to 10,000 feet) and Khási Hills.

This very variable species connects *Tropidonotus* with *Zamenis*. The keels on the scales are sometimes, especially in females, wanting throughout the greater part of the body.

425. Tropidonotus khasiensis.

Eye moderate; its diameter not more than its distance from the nostril; rostral just visible from above; suture between the internasals as long as that between the præfrontals; frontal slightly longer than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or a little longer than deep; one or two præoculars; three postoculars; temporals 1+1; upper labials 9 normally, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, rather strongly keeled, the outer row smooth. 150–154 ventrals; anal divided; subcaudals 80–100. Pale brown above, some of the scales edged with darker; head with more or less distinct yellowish dots or vermiculations; labials yellow in the middle and dark brown on the borders; an oblique yellow streak edged with dark brown on each side of the nape, forming the continuation of the series of yellow labial spots; ventrals and subcaudals yellowish, with an interrupted brown streak or series of spots along each side.

Total length 23 inches; tail 7·5.

Hab. Khási Hills.

426. Tropidonotus beddomii.

Spilotes vittatus, *Beddome, Madras Journ. Med. Sc.* 1863.
Tropidonotus beddomii, *Günth. Rept. B. I.* p. 269, pl. xxii, fig. E; *Theob. Cat.* p. 176.

Eye moderate, its diameter in the adult equalling its distance from the nostril; rostral just visible from above; suture between the internasals as long as that between the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal as long as deep or deeper than long; one præocular; three (rarely two) postoculars; temporals 1+1 or 1+2; upper labials 8 or 9, third, fourth, and fifth, or fourth, fifth, and sixth, entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, rather strongly keeled, the outer, however, perfectly smooth. Ventrals 131–150; anal divided; subcaudals 65–75. Brown above; a series of yellow spots, each between two black spots or short transverse bands, along each side of the back; upper labials yellowish with black sutures; a yellow, black-edged, oblique streak from the eye to the gape; a yellow band across the nape, behind the parietals, becoming indistinct with age; belly white, closely dotted with brown on the sides.

Total length 20 inches; tail 5.

Hab. Wynaad, Nilgiris, Anaimalais (4700 feet).

427. Tropidonotus parallelus.

Tropidonotus dipsas (*non Blyth*), *Anders. An. Zool. Res. Yunnan*, p. 819.

Eye moderate, its diameter nearly equal to its distance from the nostril; rostral just visible from above; suture between the internasals as long as that between the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal as long as deep; one or two (or three) præoculars; three postoculars; temporals 1+1, 1+2, or 2+2; upper labials 8 normally, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, strongly keeled, those of the outer row more or less distinctly keeled. Ventrals 163–172 (160–175, *Anderson*); anal divided; subcaudals 73–86 (95, *Anderson*). Olive-brown above, the scales edged with blackish, with two yellowish, black-edged dorsal bands running along the back and tail; a short yellow longitudinal streak behind the occiput; a black streak from the eye to the commissure of the mouth; labials yellow; ventrals and subcaudals uniform yellow, or with a black dot on each side.

Total length 22 inches; tail 5½.

Hab. Sikhim, Khási Hills, hills of Upper Burma and Yunnan.

428. Tropidonotus chrysargus.

Tropidonotus chrysargus, *Schleg. Phys. Serp.* ii, p. 312, pl. xii, figs. 6 & 7.
Tropidonotus junceus, *Cantor, J. A. S. B.* xvi, 1847, p. 940; *Günth. Rept. B. I.* p. 268, pl. xxii, fig. F; *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 434; *Theob. Cat.* p. 176.
Leptophis albomaculatus, *Dum. & Bibr. Erp. Gén.* vii, p. 541.
Amphiesma chrysargum, *Dum. & Bibr. t. c.* p. 739.
Tropidonotus dipsas, *Blyth, J. A. S. B.* xxiii, 1854, p. 297.
? Tropidonotus zebrinus, *Blyth, t. c.* p. 295; *Theob. t. c.* p. 173.
Amphiesma platyceps, *Jan, Icon. Ophid.* 29, pl. ii, fig. 1.

Eye large, its diameter exceeding its distance from the nostril; rostral just visible from above; suture between the internasals as long as that between the præfrontals or a little shorter; frontal as long as its distance from the end of the snout, shorter than the parietals; loreal nearly as deep as long; one or two præoculars, three postoculars; temporals 2+2 or 2+3; upper labials 9 or 8, fourth, fifth, and sixth, or third, fourth, and fifth, entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, strongly keeled, those of the outer row distinctly keeled. Ventrals 143–169; anal divided; subcaudals 60–92. Brownish or olive-green above, with a series of yellow spots or short transverse bars along each side of the back; young with black spots and cross bars, which become indistinct with age; upper lip white, with the sutures between the labials black, the white colour extending as an angular or crescentic marking on the nape; belly yellowish, with or without blackish dots and with a more or less distinct series of small black spots along each side.

Total length $2\frac{1}{2}$ feet; tail 7·5 inches.

Hab. Eastern Himalayas (3000–6000 feet), Assam, Burma, Southern China, the Malay Peninsula, Java, Borneo, and Sumatra. Appears to be everywhere chiefly a mountain form.

429. Tropidonotus nigrocinctus.

Tropidonotus nigrocinctus, *Blyth, J. A. S. B.* xxiv, 1856, p. 717; *Günth. Rept. B. I.* p. 269; *Theob. Cat.* p. 175.

Eye large, its diameter exceeding its distance from the nostril; rostral just visible from above; suture between the internasals a little shorter than that between the præfrontals; frontal a little longer than its distance from the end of the snout and a little shorter than the parietals; loreal slightly longer than deep; one or two præoculars; three postoculars; temporals 1+2; upper labials 9, fourth, fifth, and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales in 19 rows, strongly keeled, the outer row distinctly keeled. Ventrals 155–160; anal divided; subcaudals 81–89. Olive-grey above, green towards the head, with narrow transverse black streaks; an oblique black streak below the eye, another behind the eye, and a third on each side of the neck; lower parts yellowish, dotted with brown posteriorly.

Total length 26 inches; tail 7.

Hab. Pegu and Tenasserim.

430. Tropidonotus ceylonensis.

Tropidonotus chrysargus, var. ceylonensis, *Günth. Cat. Col. Sn.* p. 71.
Tropidonotus ceylonensis, *Günth. Rept. B. I.* p. 268, pl. xxii, fig. G; *Theob. Cat.* p. 178.

Eye rather large, its diameter a little exceeding its distance from the nostril; rostral just visible from above; suture between the internasals a little shorter than that between the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as deep as long; two præoculars; three postoculars; temporals 2+2 or 2+3; upper labials 8 normally, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, strongly keeled, the outer row smooth or faintly keeled. Ventrals 133–141; anal divided; subcaudals 48–54. Olive-brown above, with black cross bands and a series of large yellow black-edged ocelli along each side of the back; these markings less distinct in the adult; lips white; a black band on each side of the head behind the eye; a black band on each side of the nape, converging towards its fellow posteriorly, the space between them yellow in the young; belly uniform yellowish, or powdered with brown posteriorly.

Total length 18 inches; tail 3·5.

Hab. Ceylon.

431. Tropidonotus subminiatus.

Tropidonotus subminiatus, *Schleg. Phys. Serp.* ii, p. 313; *Günth. Rept. B. I.* p. 265; *Anders. P. Z. S.* 1871, p. 177; *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 434, pl. xxvi, fig. 3; *Theob. Cat.* p. 177; *Anders. An. Zool. Res. Yunnan*, p. 822.
Amphiesma subminiatum, *Dum. & Bibr. Erp. Gén.* vii, p. 734; *Jan, Icon. Ophid.* 29, pl. i, fig. 3.

Eye rather large, its diameter a little exceeding its distance from the nostril; rostral just visible from above; suture between the internasals shorter than that between the præfrontals; frontal as long as its distance from the end of snout or a little longer, shorter than the parietals; loreal as long as deep or deeper than long; one præocular; three postoculars; temporals 2+2 or 2+3; upper labials 8 normally, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales in 19 rows, strongly keeled, those of the outer row smooth. Ventrals 132–166; anal divided; subcaudals 68–87. Brownish, greyish olive, or olive-green above, adult uniform or with black and yellow reticulations; neck often tinged with bright vermilion; a dorso-lateral series of light spots may be present; a black oblique spot below the eye, on a white ground; young with a jet-black cross band on the nape, bordered with yellow posteriorly; belly yellowish; frequently a black dot on the outer end of each ventral shield.

Total length 3½ feet; tail 10 inches.

Hab. From Sikhim, Assam, Burma, and Southern China to the Malay Peninsula and Java. This is a common species, chiefly inhabiting hilly country, though rarely found above 3000 or 4000 feet.

432. Tropidonotus himalayanus.

Xenodon macrophthalmus, part., *Günth. Cat. Col. Sn.* p. 58.
Tropidonotus macrophthalmus, part., *Günth. Rept. B. I.* p. 262.
Tropidonotus himalayanus, *Günth. op. cit.* p. 265, pl. xxii, fig. H; *Anders. P. Z. S.* 1871, p. 178; *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 434; *Theob. Cat.* p. 178.

Agrees very closely in structure and in colour with *T. subminiatus*, from which it is distinguished by having two labials only (normally fourth and fifth) entering the eye, and by the presence of a yellow or orange collar separating the head from the black nuchal spot. Sometimes a single anterior temporal, more frequently two. Ventrals 158–170; subcaudals 79–90.

Total length 2 feet 9 inches; tail 8 inches.

Hab. Himalayas (Nepal and Sikhim) and Assam Hills. Dr. Stoliczka observes that this species is not common in Sikhim and that it is mostly confined to the lower valleys, rarely going up to or above 5000 feet.

433. Tropidonotus monticola.

Tropidonotus monticola, *Jerdon, J. A. S. B.* xxii, 1853, p. 530; *Günth. Rept. B. I.* p. 267; *Theob. Cat.* p. 178.

Eye large, its diameter more than its distance from the nostril; rostral just visible from above; suture between the internasals shorter than that between the præfrontals; frontal considerably longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep, or deeper than long; one præocular; three postoculars; temporals 2+2; upper labials 8, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales in 19 rows, strongly keeled, the outer row smooth or feebly keeled. Ventrals 134–142; anal divided; subcaudals 80–92. Green above, with black cross bands divided on each side by a pale spot; a white line across the head behind the eyes and a white dot on each side of the frontal; præ- and postoculars and labials 3 to 6, white; lower parts white.

Total length 18 inches; tail 5·5.

Hab. South Canara, Wynaad, Anaimalai Hills.

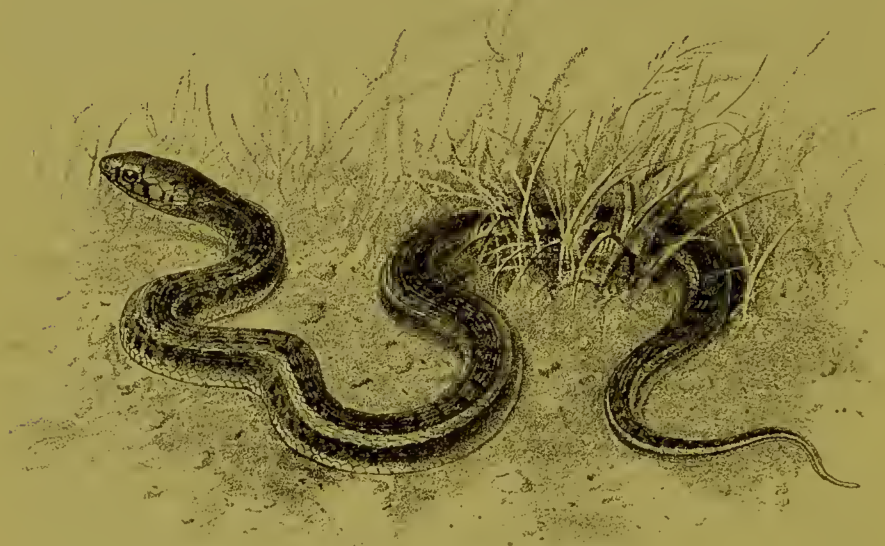

Fig. 101.—*Tropidonotus stolatus.*

434. Tropidonotus stolatus.

Russell, Ind. Serp. i, pl. x, and ii, pls. xv B & xix.
Coluber stolatus, *Linn. Syst. Nat.* i, p. 379.
Tropidonotus stolatus, *Boie, Isis,* 1827, p. 535; *Schleg. Phys. Serp.* ii, p. 317; *Cantor, J. A. S. B.* xvi, 1847, p. 937; *Günth. Rept. B. I.* p. 266; *Theob. Cat.* p. 177; *Anders. An. Zool. Res. Yunnan,* p. 816; *Murray, Zool. Sind,* p. 379.
Amphiesma stolatum, *Dum. & Bibr. Erp. Gén.* vii, p. 727.

Eye moderate, as long as its distance from the nostril in the adult; rostral just visible from above; internasals much narrowed anteriorly, subtriangular with the anterior angle truncated, nearly as long as the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep or deeper than long; one præocular, three postoculars; temporals 1+1 or 1+2; upper labials 8 normally, third, fourth, and fifth entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, strongly keeled, outer row perfectly smooth. Ventrals 125–161; anal divided; subcaudals 50–85. Greenish or brownish olive, with black spots or reticulated cross bars intersected by two yellow longitudinal bands which are best marked posteriorly; præ- and postoculars yellowish; lower surfaces white, usually with a black spot on each side of each ventral; nape red during the breeding-season.

Total length 2 feet 3 inches; tail 7 inches.

Hab. A common species all over India and Ceylon, extending to Sind; specimens were collected by Mr. Davison in the Nilgiris at an altitude of 5900 feet. Occurs also in Burma and the Malay Peninsula, and in Southern China.

435. Tropidonotus piscator.

Russell, Ind. Serp. i, pls. xx, xxviii, xxxiii, and ii, pls. iii, xiv, xv A.

Hydrus piscator, *Schneid. Hist. Amph.* i, p. 247.

Coluber rectangulus, *Gray, Ill. Ind. Zool.* ii, pl. lxxxii, figs. 4–7.

Tropidonotus piscator, *Boie, Isis*, 1827, p. 535.

Tropidonotus quincunciatus, *Schleg. Phys. Serp.* ii, p. 307, pl. xii, figs. 4 & 5; *Dum. & Bibr. Erp. Gén.* vii, p. 592; *Günth. Rept. B. I.* p. 260; *Jan, Icon. Ophid.* 27, pl. i; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 190, and xl, 1871, pt. 2, p. 431, pl. xxvi, fig. 1; *Blanf. J. A. S. B.* xxxix, 1870, pt. 2, p. 371; *Theob. Cat.* p. 175; *Anders. An. Zool. Res. Yunnan*, p. 821; *Murray, Zool. Sind*, p. 379.

Tropidonotus umbratus, *Schleg. t. c.* p. 309; *Cantor, J. A. S. B.* xvi, 1847, p. 936.

Tropidonotus tytleri, *Blyth, J. A. S. B.* xxxii, 1863, p. 88.

Tropidonotus striolatus, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 55.

Eye rather small, shorter than its distance from the nostril in the adult; rostral visible from above; internasals much narrowed anteriorly, subtriangular with the anterior angle truncated, as long as the præfrontals; frontal longer than its distance from the end of the snout, as long as the parietals or a little shorter; loreal nearly as long as deep; one præocular; three (rarely four) post-oculars; temporals 2+2 or 2+3; upper labials 9 normally, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 19 rows, strongly keeled, outer rows smooth. Ventrals 125–158; anal divided; subcaudals 64–90. Coloration very variable,

consisting of dark spots arranged quincuncially and often separated by a whitish network, or of black longitudinal bands on a pale ground, or of dark cross bands, with or without whitish spots, &c. &c.; two oblique black streaks, one below and the other behind the eye, are nearly constant; lower parts white, with or without black margins to the shields.

Total length 4 feet; tail 1 foot.

Hab. Found in or near rivers and pools all over India and Ceylon, Burma and Southern China to the Malay Peninsula and Archipelago.

436. Tropidonotus bellulus.

Tropidonotus bellulus, *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 432, pl. xxvi, fig. 2; *Theob. Cat.* p. 176.

This species, which is unknown to me, is based on a single young specimen, allied to *T. piscator*, but differing in the following characters:—Internasals less pointed, slightly longer than the præfrontals; fourth, fifth, and sixth labials entering the eye; temporals 1+2. All the scales sharply keeled. Ventrals 140; subcaudals 63. Olive-brown above, with two longitudinal series of black dots along the back; sides of neck with transverse yellowish bars; præ- and postoculars yellow; labials black-edged; ventrals and subcaudals greenish or dull white, with deep black edges.

Total length 16·5 inches; tail 5.

Hab. Hills between Prome and Toungngoo, Pegu.

437. Tropidonotus sancti-johannis.

Diameter of the eye a little less than its distance from the nostril; rostral visible from above; internasals much narrowed anteriorly, subtriangular with the anterior angle truncated, as long as the præfrontals; frontal longer than its distance from the end of the snout, nearly as long as the parietals; loreal slightly longer than deep; one præocular; three postoculars; temporals 2+2; upper labials 9, fourth entering the eye, fifth very small, triangular, wedged in between the fourth and sixth; 5 lower labials in contact with the anterior chin-shields, which are much shorter than the posterior. Scales in 19 rows, dorsals rather feebly keeled, the two or three outer rows smooth. Ventrals 158; anal divided; subcaudals 85. Uniform olive above, whitish inferiorly.

Total length 16 inches; tail 4.

Hab. A single specimen was obtained in Kashmir by Sir O. B. St. John, and presented to the British Museum.

438. Tropidonotus punctulatus.

Tropidonotus punctulatus, *Günth. Cat. Col. Sn.* p. 247; *id. A. M. N. H.* (4) i, 1868, p. 420; *id. Zool. Rec.* 1870, p. 74; *Theob. Cat.* p. 173.

Fowlea peguensis, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 57.

Eye rather small, its diameter a little less than its distance from the end of the snout; rostral visible from above, forming a narrow suture with the internasals, which are much narrowed anteriorly and nearly as long as the præfrontals; frontal longer than its distance from the end of the snout, nearly as long as the parietals; loreal as long as deep; one præocular; two or three postoculars; temporals 2+2 or 2+3; 9 (exceptionally 10) upper labials, fourth and fifth (or fifth and sixth) entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 17 rows, smooth or faintly keeled. Ventrals 142–154; anal divided; subcaudals 62–83. Brown or black above, with small pale markings or dots; two outer rows of scales, the ventrals and subcaudals yellowish with dark margins; upper lip uniform yellowish; frequently a light, curved longitudinal streak on each side of the nape.

Total length 2 feet; tail 6 inches.

Hab. Pegu.

439. Tropidonotus plumbicolor.

Tropidonotus plumbicolor, *Cantor, P. Z. S.* 1839, p. 54; *Günth. Rept. B. I.* p. 272; *id. Zool. Rec.* 1865, p. 154; *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 438; *Anders. P. Z. S.* 1871, p. 176; *Theob. Cat.* p. 179; *Murray, Zool. Sind,* p. 380.

Xenodon viridis, *Dum. & Bibr. Erp. Gén.* vii, p. 763.

Trigonocephalus ellioti, *Jerdon, J. A. S. B.* xxii, 1854, p. 523.

Amphiesma brachyurum, *Jan, Elenco,* p. 73; *id. Arch. Zool. Anat. Phys.* iii, 1865, p. 237, *and Icon. Ophid.* 29, pl. iii, fig. 2.

Halys elliotti, *Theob. Cat.* p. 225.

Habit stout, viperine. Eye moderate; rostral just visible from above; suture between the internasals as long as that between the præfrontals or a little shorter; frontal as long as its distance from the end of the snout or a little longer, as long as the parietals or a little shorter; loreal as long as deep or deeper, sometimes entering the eye; two præoculars, three or four postoculars; temporals 2+3 or 4; upper labials 7, third and fourth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales strongly keeled, in 23 to 27 rows. Ventrals 144–160; anal usually divided; subcaudals 35–50. Dull green above, uniform or with traces of black markings; young with a large chevron-shaped black mark on the nape and occiput, the point on the frontal shield bordered posteriorly with bright yellow; a black band from the eye to the angle of the mouth, and more or less regular transverse black spots or bands on the body; belly blackish, or yellowish with or without brown spots.

Total length $2\frac{1}{2}$ feet; tail 3·5 inches.

Hab. India; not uncommon in the Madras and Bombay Presidencies and Ceylon. A large specimen was obtained, at an altitude of 4700 feet, in the Anaimalai Hills by Mr. W. Davison.

The following species, unknown to me, appears to be insufficiently characterized:—

Tropidonotus angusticeps, Blyth, J. A. S. B. xxiii, 1855, p. 295.

Head narrow, not broader than the neck; two to four præ- and four or five postoculars. Ventrals 167–172; subcaudals 57–67. Plumbeous above, uniformly spotted with black; below whitish, more or less varigated with black on the hinder half; a V-like mark on the nape, with the apex towards the occiput, becoming obsolete in adults.

Total length 41 inches; tail 8·5.

Hab. Assam and Arrakan.

Genus **HELICOPS**,

Wagler, Syst. Amph. p. 170, 1830.

Maxillary teeth about 20, posterior largest; mandibular teeth subequal. Head slightly distinct from neck; eye moderate or rather small, with round pupil; nostrils directed upwards, in a semidivided nasal; a single internasal. Body rather stout, cylindrical; scales keeled, in 19 to 23 rows, without apical pits; ventrals rounded; subcaudals in two rows.

With the exception of the following, the species of this genus inhabit Tropical America. Habits aquatic; feeding on batrachians and fishes.

440. **Helicops schistosus.**

Russell, Ind. Serp. ii, pl. iv.
Coluber schistosus, *Daud. Rept.* vii, p. 132.
Tropidonotus schistosus, *Schleg. Phys. Serp.* ii, p. 319; *Cantor, J. A. S. B.* xvi, 1847, p. 938; *Dum. & Bibr. Erp. Gén.* vii, p. 596.
Tropidonotus mœstus *and* T. turgens, *Cantor, P. Z. S.* 1839, p. 54.
Atretium schistosum, *Günth. Rept. B. I.* p. 273; *Theob. Cat.* p. 179.
Helicops schistosus, *Jan, Icon. Ophid.* 28, pl. ii, fig. 3.
Atretium schistosum, var. yunnanensis, *Anders. An. Zool. Res. Yunnan,* p. 822.

Eye moderate; rostral just visible from above, forming a narrow suture with the internasal; frontal much longer than its distance from the end of the snout, shorter than the parietals; loreal deeper than long; one præocular; two or three postoculars; temporals 2+2; upper labials 8 or 9, third and fourth or fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales more or less distinctly keeled, in 19 rows. Ventrals 129–151; anal divided; subcaudals 55–85. Olive-brown above, uniform or with two series of small black spots along the back; a more or less distinct dark lateral streak; upper lip, outer row of scales, and lower surfaces yellowish.

Total length 2½ feet; tail 7 inches

Hab. Southern India and Ceylon, Bengal, Burma, Yunnan, Malay Peninsula.

Cantor says this species is very fierce, and has the power of flattening and laterally expanding the skin of the anterior part of the body, like the Cobra, but in a much slighter degree.

Genus **XENOCHROPHIS,**

Günther, Rept. Brit. Ind. p. 273, 1864.

Maxillary teeth about 20, subequal; anterior mandibular teeth longest. Head slightly distinct from neck; eye moderate, with round pupil; head-shields normal, but nostril in the upper part of

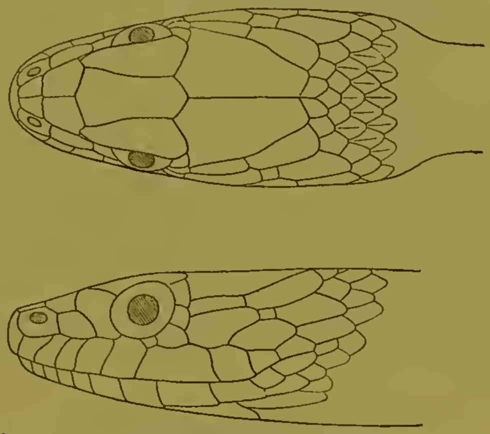

Fig. 102.—Head of *Xenochrophis cerasogaster.*

a single nasal. Body moderately elongate, cylindrical; scales keeled, in 19 rows, without apical pits; ventrals rounded; subcaudals in two rows.

A single species.

441. **Xenochrophis cerasogaster.**

Psammophis cerasogaster, *Cantor, P. Z. S.* 1839, p. 52.
Tropidonotus cerasogaster, *Cantor, J. A. S. B.* xvi, 1847, p. 939.
Xenochrophis cerasogaster, *Günth. Rept. B. I.* p. 274; *Theob. Cat.* p. 180.

Head narrow, elongate, with angular canthus rostralis and slightly concave lores; eye moderate or rather small. Rostral once and one third to twice as broad as long; suture between the internasals nearly as long as that between the præfrontals; frontal much longer than its distance from the end of the snout, as long as the parietals; loreal as long as deep or a little longer than deep; one præocular; two or three postoculars and one or two suboculars; temporals 2+2 or 2+3; upper labials 9, fourth (rarely fifth) entering the eye; 5 or 6 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little shorter. Scales strongly keeled, in 19 rows. Ventrals 140–151;

anal divided; subcaudals 60–79. Brown above, with or without darker spots and with a more or less distinct paler dorso-lateral band; lower parts cherry-red to purplish black, with a yellow band on each side extending from the lips to the end of the tail.

Total length 2 feet; tail 5·5 inches.

Hab. From Bengal, Assam, and the Khási Hills to the Malay Peninsula.

Like *Psammodynastes pulverulentus*, this Snake has a repulsive expression; it is said to be of very fierce habits.

Subfamily II. ACROCHORDINÆ.

Postfrontal bone produced over the supraorbital region. Scales not imbricate.

This group contains five genera: three with well-developed ventral shields, viz. *Stoliczkaia*, Jerd. (Khási Hills), *Xenodermus*, Reinh. (Java and Sumatra), and *Nothopsis*, Cope (Isthmus of Darien); two without ventrals, viz. *Acrochordus*, Hornst. (Malay Peninsula and Archipelago), and *Chersydrus*, Cuv.

The two Indian genera are distinguished as follows:—

Head and belly shielded .... STOLICZKAIA, p. 354.
Head and belly covered with small scales.... CHERSYDRUS, p. 355.

Genus STOLICZKAIA,

Jerdon, P. A. S. B. 1870, p. 81.

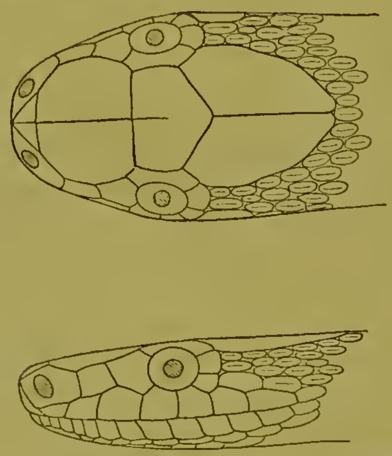

Fig. 103.—Head of *Stoliczkaia khasiensis*.

Teeth small, subequal, about 14 in each maxillary. Head distinct from neck, covered with large shields; nostrils directed forwards; eye small, with round pupil. Body slender, compressed; scales elliptical, strongly keeled, increasing in size towards the

ventrals, which are well developed; tail long, with single subcaudals.

This genus is allied to *Xenodermus*, Reinh., but differs in the equal dorsal scales and the presence of large symmetrical shields on the upper surface of the head. A single species.

442. Stoliczkaia khasiensis.

Stoliczkia khasiensis, *Jerdon, P. A. S. B.* 1870, p. 81; *Theob. Cat.* p. 205.

Rostral extremely small; a pair of small internasals; a pair of very large præfrontals; frontal broader than long and shorter than the præfrontals; supraocular very narrow; parietals nearly twice as long as the frontal; nostril in a single nasal; a loreal; a large præocular and two postoculars; upper labials 8, fifth and sixth entering the eye, eighth much elongate; temporals small, scale-like; a single pair of small chin-shields, in contact with 3 lower labials. Scales in 30 rows, dorsals separated by naked skin, laterals larger and juxtaposed. Ventrals 210; anal entire; subcaudals 115. Purplish brown above; three or four outer rows of scales and ventrals white with brown edges.

Total length 26·5 inches; tail 7·5.

Hab. Khási Hills. A single specimen is known, and no observations were made on its habits.

Genus CHERSYDRUS,

Cuvier, Règne Animal, ii, p. 75, 1817.

Teeth moderately large, subequal, about 12 in each maxillary. Head not distinct from neck, small, covered with small juxtaposed scales; nostrils close together on the top of the snout; eye very small, with vertically subelliptic pupil. Body compressed, stout; scales very small, rhomboidal, with a short tubercle-like keel, spinose on the belly; no ventrals; a fold of the skin running along the median line of the abdomen; tail short, compressed, prehensile, scaled like the body.

A single species.

Chersydrus is the Aglyphous representative of the Hydrophids, with which it agrees in its mode of life and general appearance.

443. Chersydrus granulatus.

Hydrus granulatus, *Schneid. Hist. Amph.* i, p. 243.
Acrochordus fasciatus, *Shaw, Zool.* iii, p. 576, pl. cxxx; *Schleg. Phys. Serp.* ii, p. 429, pl. xiv, figs. 14–16.
Chersydrus fasciatus, *Cuv. Règne An.* 2nd ed. ii, p. 98; *Dum. & Bibr. Erp. Gén.* vii, p. 41.
Acrochordus granulatus, *Cantor, J. A. S. B.* xvi, 1847, p. 906.
Chersydrus granulatus, *Günth. Rept. B. I.* p. 336; *Theob. Cat.* p. 186.

About 100 scales round the middle of the body, dorsals largest. Dark olive or blackish, with pale cross bands or annuli, which may become indistinct in the adult.

Total length 3 feet 4 inches; tail 4 inches.

Fig. 104.—*Chersydrus granulatus.*

Hab. Mouths of rivers and coasts of Southern India, Burma, Malay Peninsula and Archipelago, and New Guinea. This snake never leaves the water and occurs miles out at sea; it is viviparous and feeds on fish.

Series B. **OPISTHOGLYPHA.**

Posterior maxillary teeth grooved.

Subfamily III. DIPSADINÆ.

Nostrils lateral. Terrestrial or arboreal.

Represented in every part of the world.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Posterior border of ventral shields without lateral notch.
  a. Only posterior grooved fangs of maxilla enlarged; scales of vertebral row enlarged; pupil vertically elliptical.
    a′. Head very distinct from neck ...... Dipsas, p. 357.

b'. Head scarcely distinct from neck; œsophageal teeth................ ELACHISTODON, p. 362.
b. Some of the solid maxillary teeth enlarged, fang-like.
a'. Pupil vertically elliptic .... PSAMMODYNASTES, p. 363.
b'. Pupil round; loreal shield much elongate .... PSAMMOPHIS, p. 365.
c'. Pupil horizontal................. DRYOPHIS, p. 367.
B. Posterior border of ventral shields with a lateral notch corresponding to a suture-like lateral keel .... CHRYSOPELEA, p. 371.

Genus DIPSAS,

Boie, Isis, 1827, p. 548.

Maxillary teeth 10 to 12, subequal in size, followed by two or three grooved fangs; anterior mandibular teeth longest. Head very distinct from neck; eye moderate or large, with vertically

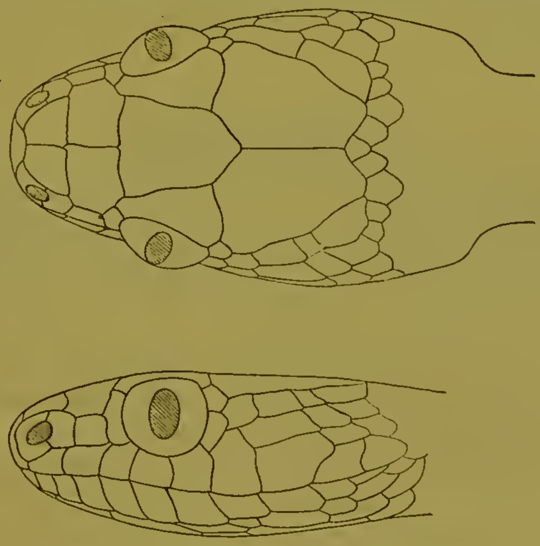

Fig. 105.—Head of *Dipsas trigonata.*

elliptic pupil; head-shields normal; posterior nasal more or less deeply concave. Body elongate, more or less compressed; scales smooth, in 17 to 27 rows, vertebral row enlarged; tail moderate or long; subcaudals in two rows.

A genus of about 20 species, found in Southern Asia, Papuasia, North Australia, and Africa. Terrestrial or arboreal, feeding on mammals, birds, and lizards.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Anterior palatine and mandibular teeth but little larger than posterior; scales in 17 to 21 rows.
a. Vertebral scales feebly enlarged.
a'. 3 labials entering eye; one præocular . *D. trigonata*, p. 358.
b'. 2 labials entering eye; 3 præoculars . . *D. barnesii*, p. 359.

b. Vertebral scales much enlarged, nearly as broad as long in middle of body.
  a'. Præocular reaching upper surface of head .... *D. ceylonensis*, p. 359.
  b'. Præocular not reaching upper surface of head.
    a''. Scales in 21 rows .... *D. gokool*, p. 360.
    b''. Scales in 17 or 19 rows .... *D. multimaculata*, p. 360.

B. Anterior palatine teeth but little longer than posterior; anterior mandibular teeth considerably larger than posterior; scales in 17 to 21 rows, vertebrals much enlarged but longer than broad in middle of body.
  a. Præocular not reaching upper surface of head............................ *D. hexagonotus*, p. 361.
  b. Præocular reaching upper surface of head; uniform green above .... *D. cyanea*, p. 361.

C. Anterior palatine and mandibular teeth considerably larger than the others; scales in 25 or 27 rows .... *D. forstenii*, p. 362.

444. Dipsas trigonata.

Russell, Ind. Serp. i, pl. xv.
Coluber trigonatus, *Schneid. in Bechst. Uebers. Lacép.* iv, p. 156.
Dipsas trigonata, *Boie, Isis*, 1827, p. 549; *Dum. & Bibr. Erp. Gén.* vii, p. 1136; *Günth. Rept. B. I.* p. 312; *Jan, Icon. Ophid.* 38, pl. iii, fig. 2; *Theob. Cat.* p. 196; *Blanf. J. A. S. B.* xlviii, pt. 2, 1879, p. 131; *Murray, Zool. Sind*, p. 383.

Anterior palatine and mandibular teeth scarcely larger than the posterior. Eye as long as its distance from the nostril; rostral broader than deep; internasals shorter than the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or deeper than long; one præocular, not extending to the upper surface of the head; two postoculars; temporals 2+3; upper labials 8, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are about as long as the posterior. Body moderately compressed; scales in 21 (rarely 19) rows, disposed obliquely, vertebrals very feebly enlarged. Ventrals 229–269; anal entire; subcaudals 79–92. Yellowish olive or pale grey above, with a white black-edged zigzag band along the back; head with two brown bands edged with black, diverging posteriorly; belly white, with or without a series of small brown spots along each side.

Total length 3 feet; tail 7 inches.

Hab. India generally, Western Himalayas, and Baluchistan. This species is more terrestrial than its congeners and is found in arid tracts in Baluchistan and Sind; it bears a considerable resemblance in general shape and colour to *Echis carinata*, which has nearly the same distribution in India.

445. Dipsas barnesii.

Dipsas barnesii, *Günth. P. Z. S.* 1869, p. 506, pl. xl, fig. 2; *Theob. Cat.* p. 195.

Anterior palatine and mandibular teeth scarcely larger than the posterior. Eye large, as long as the snout. Rostral as deep as broad; internasals much shorter than the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal a little longer than deep; three præ- and two postoculars; temporals 1+3 or 2+3; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are nearly as long as the posterior. Body strongly compressed; scales in 19 rows, scarcely oblique, vertebrals very feebly enlarged. Ventrals 220; anal entire; subcaudals 99. Grey-brown above, with lighter black-edged transverse spots; a series of black spots along each side, near the ventrals; a blackish band behind the eye; labial sutures blackish; lower parts whitish, powdered with brown.

Total length 22 inches; tail 5.

Hab. Ceylon.

446. Dipsas ceylonensis.

Dipsadomorphus ceylonensis, *Günth. Cat. Col. Sn.* p. 176.
Dipsas multifasciata, *Blyth, J. A. S. B.* xxix, 1860, p. 114; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 199, pl. xi, fig. 6, and xl, 1871, pt. 2, p. 440.
Dipsas ceylonensis, *Günth. Rept. B. I.* p. 314, pl. xxiii, fig. B; *Theob. Cat.* p. 196.
Dipsas hexagonata, part., *Anders. P. Z. S.* 1871, p. 185.
Dipsas nuchalis, *Günth. P. Z. S.* 1875, p. 233.

Anterior palatine and mandibular teeth scarcely larger than the posterior. Eye shorter than the snout. Rostral a little broader than deep; internasals shorter than the præfrontals; frontal longer than its distance from the end of the snout, a little shorter than the parietals; loreal square or deeper than long; one or two præoculars, reaching the upper surface of the head; two postoculars; temporals small, scale-like, 2+3 or 3+3; upper labials 8, third, fourth, and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Body strongly compressed; scales in 19 or 21 rows, not very oblique; scales of the vertebral row much enlarged, in the middle of the body nearly as broad as long. Ventrals 214–249; anal entire; subcaudals 90–117. Brown or greyish above, with a series of blackish transverse spots or bands; nape with a blackish blotch, or three blackish longitudinal streaks, or a transverse bar; a more or less distinct brown streak from the eye to the angle of the mouth; lower parts yellowish, dotted with brown, usually with a lateral series of brown spots.

Total length 4 feet; tail 10 inches.

Hab. Western Himalayas, hills of the west coast of India; Ceylon.

447. Dipsas gokool.

Dipsas gokool, *Gray, Ill. Ind. Zool.* ii, pl. lxxxiii, fig. 1; *Günth. Rept. B. I.* p. 313; *Theob. Cat.* p. 197.
Dipsas cynodon, part., *Cantor, J. A. S. B.* xvi, 1847, p. 924.

Anterior palatine and mandibular teeth scarcely larger than the posterior. Eye moderate, as long as its distance from the nostril. Rostral a little broader than deep; internasals much shorter than the præfrontals; frontal longer than its distance from the end of the snout, shorter than the parietals; loreal deeper than long; one or two præoculars, not extending to the upper surface of the head; two postoculars; temporals 2+3; upper labials 8, third, fourth, and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are a little longer than the posterior. Body strongly compressed; scales in 21 rows, disposed obliquely; scales of the vertebral row strongly enlarged, in the middle of the body nearly as broad as long. Ventrals 224–225; anal entire; subcaudals 87–94. Yellowish brown above; head with an arrow-shaped brown, black-edged mark, longitudinally divided into two; a black streak on each side of the head, passing through the eye; a yellowish vertebral streak; a series of erect Y-shaped marks on each side of the body; lower parts yellowish, with a series of brown spots along each side.

Total length 2 feet 8 inches; tail 7 inches.

Hab. A rare snake, hitherto recorded from Bengal, Assam, and Pinang.

448. Dipsas multimaculata.

Russell, Ind. Serp. ii, pl. xxiii.
Dipsas multimaculata, *Schleg. Phys. Serp.* ii, p. 265, pl. xi, figs. 4 & 5; *Cantor, J. A. S. B.* xvi, 1847, p. 923; *Dum. & Bibr. Erp. Gén.* vii, p. 1139; *Günth. Rept. B. I.* p. 311; *Jan, Icon. Ophid.* 38, pl. iii, fig. 3; *Theob. Cat.* p. 194.

Anterior palatine and mandibular teeth scarcely larger than the posterior. Eye a little shorter than the snout. Rostral a little broader than deep; internasals much shorter than the præfrontals; frontal as long as its distance from the end of the snout or a little longer, shorter than the parietals; loreal as long as deep or deeper than long; one præocular, not extending to the upper surface of the head; two postoculars; temporals 2+2 or 2+3; upper labials 8, third, fourth, and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little shorter. Body strongly compressed; scales in 17 or 19 rows, disposed obliquely; scales of the vertebral row strongly enlarged, in the middle of the body nearly as broad as long. Ventrals 202–235; anal entire; subcaudals 80–106. Grey-brown above, with two alternating series of roundish dark

brown spots, and two other series of smaller spots lower down on the sides; two blackish bands on the head, diverging posteriorly; a blackish streak from the eye to the angle of the mouth; lower parts whitish, marbled or spotted with brown, and with a series of brown spots along each side.

Total length $2\frac{1}{2}$ feet; tail 6 inches.

Hab. Burma, Southern China, Siam, Malay Peninsula and Archipelago; common in Pegu.

449. Dipsas hexagonotus.

Dipsas hexagonotus, *Blyth, J. A. S. B.* xxiv, 1856, p. 360; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 198, pl. xi, fig. 4, and xl, 1871, pt. 2, p. 439; *Theob. Cat.* p. 195.
Dipsas ochraceus, *Günth. A. M. N. H.* (4) i, 1868, p. 425; *Theob. J. Linn. Soc.* x, 1868, p. 53; *id. Cat.* p. 196.
Dipsas hexagonata, part., *Anders. P. Z. S.* 1871, p. 185.

Anterior palatine teeth scarcely larger than the posterior; anterior mandibular teeth considerably larger than the posterior. Eye shorter than the snout. Rostral broader than deep; internasals a little shorter than the præfrontals; frontal as long as its distance from the end of the snout, considerably shorter than the parietals; loreal as long as deep or deeper than long; one præocular, not reaching the upper surface of the head; two postoculars; temporals 2+3; upper labials 8 (rarely 9), third, fourth, and fifth (or fourth, fifth, and sixth) entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little shorter. Body strongly compressed; scales in 19 or 21 rows, disposed obliquely; scales of the vertebral row strongly enlarged, but longer than broad except on the posterior part of the body. Ventrals 218–250; anal entire; subcaudals 94–140. Dusky grey, reddish, or ochraceous above, uniform or with ill-defined blackish transverse lines; a more or less distinct brown streak from eye to gape; lower parts yellow, uniform or clouded with pale brownish in the young.

Total length $3\frac{1}{2}$ feet; tail 8 inches.

Hab. Eastern Himalayas (to 4000 feet), Bengal, Burma, Andamans.

450. Dipsas cyanea.

Triglyphodon cyaneum, *Dum. & Bibr. Erp. Gén.* vii, p. 1079.
Dipsas nigromarginata, *Blyth, J. A. S. B.* xxiii, 1855, p. 294.
Dipsas bubalina*, *Günth. Rept. B. I.* p. 311, pl. xxiv, fig. E; *Stoliczka, J. A. S. B.* xl, 1871, pt. 2, p. 441; *Theob. Cat.* p. 197.

Anterior palatine teeth scarcely larger than the posterior; anterior mandibular teeth considerably larger than the posterior. Eye shorter than the snout; rostral nearly as deep as broad; internasals a little shorter than the præfrontals; frontal as long as

* This specific name, derived from Klein, Tent. Herp. p. 21, 1755, is inadmissible, and its application to the present snake is doubtful.

its distance from the end of the snout, shorter than the parietals; one præocular, extending to the upper surface of the head; two postoculars; temporals 2+3 or 3+3; upper labials 8, third, fourth, and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are about as long as the posterior. Body strongly compressed; scales in 21 rows, disposed obliquely; scales of the vertebral row considerably enlarged but longer than broad, except on the posterior part of the body. Ventrals 249–252; anal entire; subcaudals 124–133. Uniform green above, the skin between the scales black; uniform greenish yellow below.

Total length $4\frac{1}{2}$ feet; tail 13 inches.

Hab. Assam, Cachar, and Sikhim.

451. Dipsas forstenii.

Triglyphodon forsteni, *Dum. & Bibr. Erp. Gén.* vii, p. 1077.
Dipsas forsteni, *Günth. Rept. B. I.* p. 309; *Anders. P. Z. S.* 1871, p. 187; *Stoliczka, J. A. S. B.* xl, pt. 2, 1871, p. 439; *Theob. Cat.* p. 198.

Anterior palatine and mandibular teeth considerably larger than the others. Eye about as long as its distance from the nostril; rostral broader than deep; internasals much shorter than the præfrontals; frontal nearly as long as its distance from the end of the snout, shorter than the parietals; loreal square or deeper than long; one præocular, extending to the upper surface of the head; two or three postoculars; temporals very small and numerous; 8 to 11 upper labials, third, fourth, and fifth, or fourth, fifth, and sixth, entering the eye; 3 or 4 lower labials in contact with the anterior chin-shields, which are about as long as the posterior. Body compressed; scales in 25 or 27 rows, disposed obliquely, vertebral row feebly enlarged. Ventrals 259–270; anal entire; subcaudals 106–131. Brown above, with more or less regular angular black cross bars, with or without white spots between them; a black band from the frontal shield to the nape and another on each side behind the eye; lower parts white, uniform or spotted with brown.

Total length 4 feet 10 inches; tail 1 foot.

Hab. Bengal, base of Himalayas in Sikhim, Bundelkhand, Bombay Ghâts, Anaimalai Hills, Ceylon.

Genus ELACHISTODON,

Reinhardt, Overs. Dansk. Vid. Selsk. Forh. 1863, p. 206.

Teeth few and extremely minute, with a pair of posterior maxillary grooved fangs. A series of œsophageal teeth. Head scarcely distinct from neck; eye rather small, with vertically elliptic pupil; head-shields normal; posterior nasal deeply concave. Body elongate, somewhat compressed. Scales smooth, in 15 rows, vertebral row enlarged. Subcaudals in two rows.

As in the African genus *Dasypeltis*, each of the anterior vertebræ has the hypapophysis or inferior process much elongate, tooth-like, capped with enamel and penetrating the walls of the œsophagus. It has been observed that the African snakes feed on eggs, which are broken in passing along this series of processes, and having arrived so far downwards in the gullet that the mouth can be closed, none of the contents are lost. The same is doubtless the case with *Elachistodon*.

452. Elachistodon westermanni.

Elachistodon westermanni, *Reinh. Overs. Dansk. Vid.Selsk.Forh.* 1863, p. 206, pl. —, figs. 1–5; *Günth. Rept. B. I.* p. 444; *Blanf. J. A. S. B.* xliv, 1875, p. 207; *Theob. Cat.* p. 162.

Rostral twice as broad as deep, just reaching the upper surface of the head; internasals and præfrontals subequal in size; frontal rather longer than broad, as long as its distance from the end of the snout, shorter than the parietals; loreal small, longer than deep, entering the eye; a small præocular above the loreal; two postoculars; two very long temporals; 6 or 7 upper labials, third and fourth entering the eye; 3 pairs of large chin-shields. Scales in 15 rows. Ventrals 210–217; anal entire; subcaudals 59–65. Brown above, with a yellowish vertebral band; a yellowish band commences on the snout and runs along each side of the head to the temporals and the angle of the mouth; an angular yellowish cross band on the nape; lower parts yellowish.

Total length 31 inches; tail 4·5.

Hab. A very rare snake, only two specimens being known, which I have not seen. The type was obtained at Rungpore, and the specimen described by Blanford at Purneah, both in Bengal.

Genus PSAMMODYNASTES,

Günther, Cat. Col. Sn. p. 140, 1858.

Maxillary teeth 9 or 10, second or third much elongate and fang-like, followed by a short interspace, last grooved; anterior mandibular teeth large, posterior small. Head moderate, distinct from neck, with angular canthus rostralis; eye rather large, with vertically elliptical pupil; nostril in a single nasal. Body moderate; scales smooth, without apical pits, in 17 or 19 rows; ventrals rounded; tail rather short; subcaudals in two rows.

Only two species are known; the second, *P. pictus*, Gthr. (*conjunctus*, Ptrs.), inhabits Borneo and Sumatra.

453. Psammodynastes pulverulentus.

Psammophis pulverulenta, *Boie, Isis*, 1827, p. 547.
Dipsas ferruginea, *Cantor, P. Z. S.* 1839, p. 53.

Psammodynastes pulverulentus, *Günth. Cat. Col. Sn.* p. 140; *id. Rept. B. I.* p. 292; *Anders. P. Z. S.* 1871, p. 183; *Theob. Cat.* p. 188.
Lycodon bairdi, *Steindachn. Novara, Rept.* p. 90.

Snout short, somewhat turned up in the adult, with sharp canthus rostralis and projecting supraciliary edge; rostral broader than long, scarcely visible from above; nostril in the middle of an undivided nasal; internasals much shorter than the præfrontals; frontal much longer than its distance from the end of the snout,

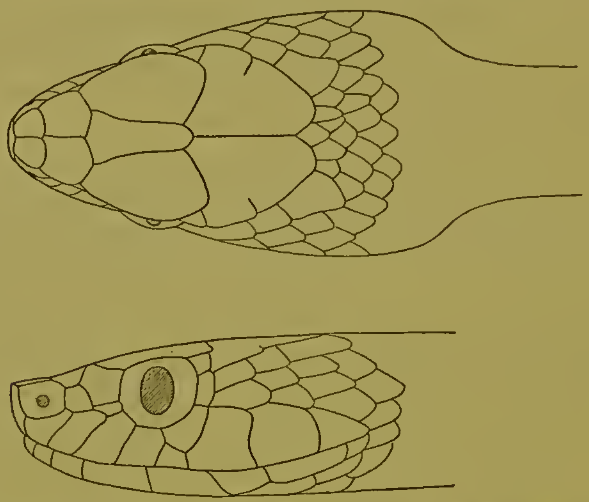

Fig. 106.—Head of *Psammodynastes pulverulentus.*

a little shorter than the parietals; loreal about as long as deep, often transversely divided into two; one or two præ- and two or three postoculars; temporals 2+3; upper labials 8, third, fourth, and sometimes fifth entering the eye; 3 lower labials in contact with the anterior chin-shields, which are followed by two smaller pairs. Scales in 17 (rarely 19) rows. Ventrals 146–175; anal entire; subcaudals 45–65. Dark brown or ochraceous above, with or without small darker and lighter spots; head with symmetrical longitudinal markings; a more or less distinct dark streak on each side of the head, passing through the eye; usually a dark brown band along each side; lower parts powdered with brown, and with dark brown spots or longitudinal lines.

Total length 20 inches; tail 3·5.

Hab. Eastern Himalayas, Khási and Assam Hills, Burma and Cochin China to the Malay Peninsula and Archipelago.

As observed by Günther, this snake has a repulsive aspect: its dark, undefined colours, short and thick head, and swollen lips, caused by the large hidden fangs, give it the appearance of a Viperine snake, for which it is often mistaken.

PSAMMOPHIS,

Boie, Isis, 1827, p. 521.

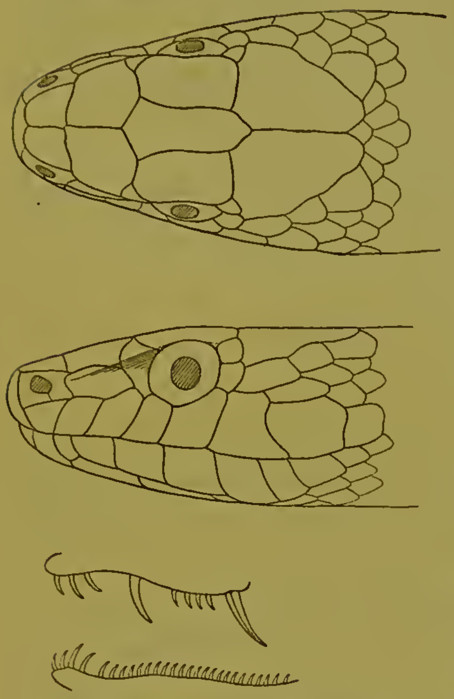

Fig. 107.—Head and dentition of *Psammophis condanarus*.

Maxillary teeth 10 to 13, one or two in the middle much enlarged, fang-like, and preceded and followed by an interspace, the two posterior grooved; anterior mandibular teeth long, posterior small. Head elongate, distinct from neck, with angular canthus rostralis; eye rather large, with round pupil. Body elongate, cylindrical; scales smooth, in 15 or 17 rows, with apical pits; ventrals rounded or obtusely angulate laterally; tail long; subcaudals in two rows.

Distribution. 9 or 10 species are known, from Africa and Southern Asia. Chiefly sand-snakes, but also found on low bushes. Feed principally on Lizards.

Synopsis of Indian Species.

A. Præocular forming a suture with the frontal. *P. leithii*, p. 365.
B. Præocular not reaching the frontal.
  a. Præfrontals much shorter than the frontal . *P. condanarus*, p. 366.
  b. Præfrontals nearly as long as the frontal . . *P. longifrons*, p. 366.

454. Psammophis leithii.

Psammophis leithii, *Günth. P. Z. S.* 1869, p. 505, pl. xxxix; *Stoliczka, P. A. S. B.* 1872, p. 83; *Blanf. Zool. E. Pers.* p. 421; *Theob. Cat.* p. 188; *Murray, Zool. Sind*, p. 382.
Psammophis sindanus, *Stoliczka, P. A. S. B.* 1872, p. 83.
Psammophis condanarus (*non Merr.*), *Blanf. J. A. S. B.* xlviii, 1879, pt. 2, p. 126.

Rostral broader than deep, visible from above; nostril between two or three shields, the posterior nasal being frequently divided into two; internasals about half the length of the præfrontals; frontal very narrow, longer than its distance from the end of the snout, nearly as long as the parietals; loreal about twice as long as deep; præocular single, in contact with the frontal; two postoculars; temporals 1+2 or 2+2; upper labials 8 or 9, fourth and

fifth or fifth and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales in 17 rows. Ventrals 177–188; anal usually entire; subcaudals 82–138. Pale greyish or yellowish above, with black dots or four longitudinal brown bands which are usually edged with black, the outer passing through the eyes; lower parts white, uniform or spotted or marked with grey or olive in the middle, with or without a dark lateral line or series of dots.

Total length 3 feet 3 inches; tail 1 foot.

Hab. Sind, Rajputana, Cutch, Baluchistan, Afghanistan, Persia, and east coast of Arabia.

455. Psammophis condanarus.

Russell, Ind. Serp. i, pl. xxvii.
Coluber condanarus, *Merr. Tent.* p. 107.
Leptophis ? bellii, *Jerdon, J. A. S. B.* xxii, 1853, p. 529.
Psammophis condanarus, *Blyth, J. A. S. B.* xxiii, 1854, p. 293; *Günth. Rept. B. I.* p. 291; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 196, and xl, 1871, pt. 2, p. 438; *Anders. P. Z. S.* 1871, p. 182; *Stoliczka, P. A. S. B.* 1872, p. 83; *Theob. Cat.* p. 187; *Murray, Zool. Sind*, p. 382.
Psammophis indicus, *Beddome, Madras Journ. Med. Sc.* 1863.
Phayrea isabellina, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 51.
Psammophis sibilans, var. quadrilineata, *Jan, Icon. Ophid.* 34, pl. iii, fig. 1.

Rostral as deep as broad, visible from above; nasal divided or semidivided; internasals rather more than half the length of the præfrontals; frontal very narrow, as long as or longer than its distance from the end of the snout, as long as the parietals; loreal about twice as long as deep; præocular single, not extending to the frontal; two postoculars; temporals 1+2 or 1+3, rarely 2+3; upper labials 8, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 17 rows. Ventrals 156–182; anal divided; subcaudals 75–90. Pale olive-brown, with two pairs of more or less distinct dark bands each two scales wide; these bands, the lower of which passes through the eye, often black-edged; upper lip and lower parts uniform yellowish, with a dark line along each side of the ventrals and subcaudals.

Total length 3 feet; tail 9 inches.

Hab. This species has hitherto only been rocorded from the Punjab, Cutch, the North-West Provinces, Simla, Bengal, the Kurnool district, and Pegu.

456. Psammophis longifrons.

Rostral as deep as broad, visible from above; nostril between the anterior and two superposed posterior nasals; internasals

hardly half as long as the præfrontals, which are only a little shorter than the frontal; the latter shield very narrow, shorter than its distance from the end of the snout, a little shorter than the parietals; loreal slightly more than twice as long as deep; præocular single, not extending to the frontal; two postoculars; temporals 2+3; upper labials 8, fourth and fifth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 17 rows. Olive above; head with symmetrical undulating black lines; scales on the vertebral line with broad black margins; uniform white beneath.

Hab. Only the head and neck of a specimen which must have been about four feet long have been preserved by Col. Beddome, who obtained this snake in the Cuddapah Hills.

Genus **DRYOPHIS,**

Boie, Isis, 1827, p. 520.

Maxillary teeth 12 to 15, one or two in the middle much enlarged, fang-like, and followed by an interspace, the two posterior grooved; of the mandibular teeth the third or fourth is largest, fang-like, the posterior small. Head elongate, distinct from neck, with angular canthus rostralis and concave lores; eye rather large, with horizontal pupil; nostril in the posterior part of a single nasal; frontal narrow, more or less bell-shaped. Body much elongate and compressed; scales smooth, without apical pits, in 15 rows, disposed obliquely, vertebral row slightly enlarged; ventrals rounded; tail long; subcaudals in two rows.

Of this genus of Tree-snakes, only seven or eight species are known, all from the East Indies.

Synopsis of Indian and Burmese Species.

A. Snout without dermal appendage.
  a. Ventral shields less than 200.
    a'. One postocular; no loreal; subcaudals 70–82 . . . . *D. perroteti*, p. 368.
    b'. 2 postoculars; 1 or 2 loreals; subcaudals 90–105 . . . . *D. dispar*, p. 368.
    c'. 2 postoculars; 3 or 4 loreals; subcaudals 120–151 . . . . *D. fronticinctus*, p. 368.
  b. Ventrals more than 200; subcaudals more than 150 . . . . *D. prasinus*, p. 369.
B. Snout ending in a dermal appendage; no loreal.
  a. Rostral appendage formed entirely by the rostral . . . . *D. mycterizans*, p. 370.
  b. Rostral appendage covered with small scales above . . . . *D. pulverulentus*, p. 371.

457. Dryophis perroteti.

Psammophis perroteti, *Dum. & Bibr. Erp. Gén.* vii, p. 899.
Leptophis? canarensis, *Jerdon, J. A. S. B.* xxii, 1853, p. 530.
Dryiophis tropidococcyx, *Günth. Cat. Col. Sn.* p. 157.
Tropidococcyx perroteti, *Günth. A. M. N. H.* (3) vi, 1860, p. 428, pl. vii, figs. 5-7; *id. Rept. B. I.* p. 301.
Dryophis perroteti, *Jan, Elenco,* p. 89; *Peters, MB. Ak. Berl.* 1868 p. 452; *Jan, Icon. Ophid.* 33, pl. v, fig. 2.
Tragops perroteti, *Theob. Cat.* p. 191.

Snout obtusely pointed and projecting, without dermal appendage, not quite twice as long as the eye. No loreal, internasals and præfrontals in contact with the labials; frontal longer than its distance from the end of the snout, as long as the parietals; one præocular, in contact with the frontal; one postocular; temporals 1+2 or 2+2; 8 (rarely 9) upper labials, fourth and fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior. Scales in 15 rows, those on sacral region keeled. Ventrals 138–140; anal divided; subcaudals 70–82. Bright green above; yellowish or pale green beneath, with a green lateral line.

Total length 2 feet; tail 5·5 inches.

Hab. North Canara and Nilgiris.

458. Dryophis dispar.

Tragops dispar, *Günth. Rept. B. I.* p. 303, pl. xxiii, fig. A; *Theob. Cat.* p. 192.

Snout pointed and projecting, without dermal appendage, not quite twice as long as the eye. Internasals and præfrontals usually in contact with the labials; one or two small loreals; frontal as long as its distance from the end of the snout or longer, as long as the parietals; one præocular, in contact with the frontal, with one or two suboculars below; two postoculars; temporals 2+2 or 2+3; upper labials 8, fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little shorter. Scales in 15 rows, those of the sacral region more or less distinctly keeled. Ventrals 142–151; anal divided; subcaudals 90–105. Bright green or bronzy olive above, the skin between the scales black; pale green or pale olive beneath, with a yellow line on each side.

Total length 26 inches; tail 7·5.

Hab. Anaimalai Hills, S. India.

459. Dryophis fronticinctus.

Dryophis fronticincta, *Günth. Cat. Col. Sn.* p. 158.
Tragops fronticinctus, *Günth. Rept. B. I.* p. 304, pl. xxiii, fig. E; *Theob. Journ. Linn. Soc.* x, 1868, p. 52; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 197; *Theob. Cat.* p. 192.
Tragops javanicus (*non Steind.*), *Günth. A. M. N. H.* (4) i, 1868, p. 424; *Theob. l. c.* p. 193.

Snout pointed and projecting, without dermal appendage, measuring about twice the diameter of the eye. Nasals usually forming a suture behind the rostral; frontal as long as its distance from the end of the snout, as long as the parietals or a little longer; usually two superposed pairs of loreals; two præoculars, upper usually in contact with the frontal; two postoculars; temporals 2+2 or 2+3; upper labials 7 or 8, fifth or sixth entering the eye; 3 or 4 lower labials in contact with the anterior chin-shields, which are much shorter than the posterior. Scales in 15 rows, those on sacral region keeled. Ventrals 190–195; anal divided; subcaudals 120–151. Bright green, olive, or bronze-brown above; pale green or olive beneath, with a white or black and white lateral streak.

Total length 3 feet; tail 1 foot.

Hab. Pegu and Arrakan. Stoliczka says this is a true brackish-water species; he found it abundant on the bushes between tide-marks near the mouth of the Moulmein river. It is as often seen diving and swimming in the water as climbing up a high bush or tree and hiding itself in the green foliage. It always takes refuge in the water when attacked. According to Theobald's observation, it is ovoviviparous.

460. Dryophis prasinus.

Russell, Ind. Serp. ii, pl. xxiv.

Dryophis prasinus, *Boie, Isis,* 1827, p. 545; *Jan, Icon. Ophid.* 33, pl. v, fig. 1.

Dryinus prasinus, *Cantor, J. A. S. B.* xvi, 1847, p. 928.

Tragops prasinus, *Dum. & Bibr. Erp. Gén.* vii, p. 824; *Günth. Rept. B. I.* p. 303; *Anders. P. Z. S.* 1871, p. 185; *Theob. Cat.* p. 191.

Snout acuminate, projecting, without dermal appendage, rather more than twice as long as the eye. Internasals usually in contact with the labials; one to four small loreals between the præfrontal and the labials; frontal as long as its distance from the end of the snout or a little longer, a little longer than the parietals; one præocular, in contact with the frontal; two postoculars; temporals 2+2 or 3+3, rarely 1+2; upper labials 9, fourth, fifth, and sixth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 15 rows, usually faintly keeled on sacral region. Ventrals 203–234; anal divided; subcaudals 167–203. Bright green, pale olive, or grey-brown, with a yellow line along each side of the lower parts; interstitial skin of the neck black and white.

Total length $5\frac{1}{2}$ feet; tail 2 feet.

Hab. Eastern Himalayas (1500–3000 feet), Khási and other Assam hills, Burma, Cochinchina, Malay Peninsula and Archipelago. Cantor says this species is exceedingly common in the Malayan forests, both in the hills and valleys, preying upon small birds, arboreal lizards, frogs, and in early age upon insects. The very young ones are as gentle as those of a more advanced age are ferocious. Like the preceding species, it is ovoviviparous.

461. Dryophis mycterizans.

Russell, Ind. Serp. i, pls. xii & xiii.
Coluber mycterizans, *Daud. Rept.* vii, p. 9, pl. lxxxi, fig. 1.
Dryinus nasutus, *Merr. Tent.* p. 136; *Dum. & Bibr. Erp. Gén.* vii, p. 809.
Dryophis nasuta, *Schleg. Phys. Serp.* ii, p. 246, pl. x, figs. 1–5; *Jan, Icon. Ophid.* 32, pl. v, fig. 2.
Passerita mycterizans, *Gray, Ann. Phil.* x, 1825, p. 208; *Günth. Rept. B. I.* p. 305; *Theob. Cat.* p. 193.
Dryinus fuscus, *Dum. & Bibr. Erp. Gén.* vii, p. 812.

Snout pointed, terminating in a dermal appendage, which is shorter than the eye and formed entirely by the rostral; the length of the snout, without the appendage, about twice the diameter of the eye or rather more. No loreal; internasals and præfrontals in contact with the labials; frontal as long as its distance from the rostral or a little longer, as long as the parietals or a little longer;

Fig. 108.—*Dryophis mycterizans.*

two præoculars and a small subocular (or one præocular and two suboculars), upper præocular in contact with the frontal; two postoculars; temporals 1 + 2 or 2 + 2; upper labials 8, fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 15 rows. Ventrals 172–188; anal divided; subcaudals 140–166. Bright green or pale brownish, the interstitial skin between the scales black and

white on the anterior part of the body, which appears striped when distended; a yellow line along each side of the lower surface.

Total length 5 feet; tail 2.

Hab. Ceylon, Southern India, Deccan, Northern Circars, Bengal, Khási Hills, Burma. A very gentle snake, generally found on bushes or high grass.

462. Dryophis pulverulentus.

Dryinus pulverulentus, *Dum. & Bibr. Erp. Gén.* vii, p. 812.
Dryophis pulverulentus, *Jan, Icon. Ophid.* 32, pl. v, fig. 1.
Passerita purpurascens, *Günth. Rept. B. I.* p. 306, pl. xxiii, fig. F; *Theob. Cat.* p. 194.

Snout pointed, terminating in a dermal appendage which is longer than the eye, formed below by the rostral, and covered above with numerous small scales or warts; the length of the snout, without the dermal appendage, more than twice the diameter of the eye. Nasals in contact behind the rostral appendage, or narrowly separated; no loreal; internasals and præfrontals in contact with the labials; frontal as long as its distance from the nasals, as long as the parietals or a little longer; two præoculars, with one subocular below, the upper præocular in contact with the frontal; two postoculars; temporals 2+3 or 2+2; upper labials 8, fifth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 15 rows. Ventrals 182–194; anal divided; subcaudals 154–173. Greyish, powdered with brown, with blackish transverse spots above; a dark brown rhomboidal spot on the upper surface of the head, and a brown band on each side, passing through the eye.

Total length 5 feet 10 inches; tail 2 feet 4 inches.

Hab. Ceylon and Anaimalai Hills (2000 feet).

Genus CHRYSOPELEA,

Boie, Isis, 1827, p. 520.

Maxillary teeth 20, subequal, the last three longer and grooved; anterior mandibular teeth longest. Head distinct from neck, elongate; eye rather large, with round pupil; head-shields normal. Body elongate, compressed; scales smooth, equal, in 15 or 17 rows, with apical pits; ventrals with suture-like lateral keel and a notch on each side corresponding to the keel. Tail long; subcaudals in two rows.

Distribution. East Indies. Two or three species are known, one of which occurs in India, Ceylon, and Burma.

463. Chrysopelea ornata.

Russell, Ind. Serp. ii, pl. ii.
Coluber ornatus, *Shaw, Zool.* iii, p. 477.

Chrysopelea ornata, *Boie, Isis,* 1827, p. 546; *Dum. & Bibr. Erp. Gén.* vii, p. 1042; *Günth. Rept. B. I.* p. 298; *Jan, Icon. Ophid.* 33, pl. i, fig. 1; *Stolickza, J. A. S. B.* xxxix, 1870, pt. 2, p. 194; *Theob. Cat.* p. 191; *Anders. An. Zool. Res. Yunnan,* p. 825.

Chrysopelea paradisi, *Boie, l. c.* p. 547.

Leptophis ornatus, *Cantor, J. A. S. B.* xvi, 1847, p. 934.

Snout much depressed, squarely truncated. Rostral broader than long, visible from above; internasals nearly as long as the præfrontals, but much narrower; frontal bell-shaped, nearly as long as its distance from the end of the snout, as long as the parietals or slightly shorter; loreal small and elongate; one præ- and two postoculars; temporals 2+2; upper labials 9 or 10, fifth and sixth, or fourth, fifth, and sixth, entering the eye; 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales smooth or faintly keeled, in 17 rows. Ventrals 204–236; anal divided; subcaudals 118–138. Varies greatly in colour; the following principal varieties occur in British India:—

a. Black above, each scale with a round greenish-yellow spot; these spots larger (coral-red in life) on the back, resembling a series of tetrapetalous flowers; ventrals greenish yellow, edged with black (Anaimalai Hills and Malay Peninsula).

b. Greenish yellow, lineolated, each scale with a black median streak, and more or less distinct black cross bands; ventrals yellow, with a small black spot on each side (Khási Hills, Burma, Anaimalais).

c. Like the preceding, but with a series of large coral-red or orange blotches along the back (Ceylon).

d. Pale olive above, with black transverse bars; a small black spot on the side of each ventral (Ceylon).

All the specimens have the head black with yellow cross bars.

Total length 4½ feet; tail 14 inches.

Hab. Ceylon, Anaimalai Hills, Bengal, Khási Hills, Assam, Burma, Siam, Malay Peninsula and Archipelago.

This snake is found as well on the ground between grass as on low bushes and trees. It feeds almost exclusively on Geckos, and is of gentle disposition.

Subfamily IV. HOMALOPSINÆ.

Thoroughly aquatic *Opisthoglypha* with the nostrils on the upper surface of the snout. Hypapophyses developed throughout the vertebral column.

The range of this subfamily appears to be restricted to Southern China, the East Indies, Papuasia, and North Australia. Of the nine genera, 7 occur within the limits of the Indian Fauna, the two others being restricted to Siam (*Herpeton,* Lacép.) and Borneo (*Homalophis,* Ptrs.) respectively. The young are brought forth alive in the water.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Nasals in contact.
  a. Scales keeled.
    a'. Parietal shields well developed .... HOMALOPSIS, p. 373.
    b'. Occiput covered with scales............ CERBERUS, p. 374.
  b. Scales smooth.......................... HYPSIRHINA, p. 375.
B. Nasals separated by an internasal.
  a. Ventrals smooth.
    a'. Body stout, not compressed; no loreal .. FORDONIA, p. 378.
    b'. Body elongate, not compressed; loreal present............................ GERARDIA, p. 379.
    c'. Body very elongate, compressed........ CANTORIA, p. 380.
  b. Ventrals with two sharp keels .... HIPISTES, p. 381.

Genus **HOMALOPSIS**,

Kuhl, in Férussac, Bull. Sc. Nat. ii, 1824, p. 81 (part.).

Maxillary teeth 12, followed by two grooved fangs. Head distinct from neck; eye small, with vertically elliptical pupil; head-shields large; nasals in contact behind the rostral, semidivided, the

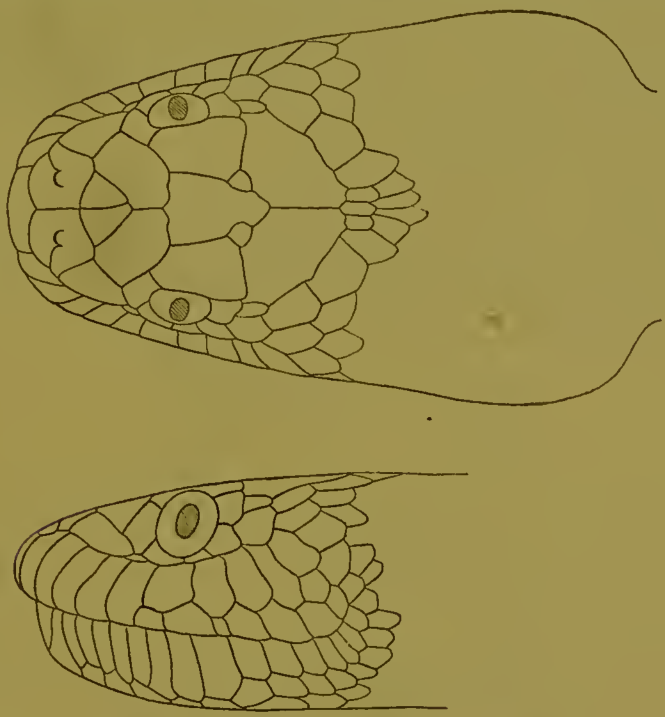

Fig. 109.—Head of *Homalopsis buccata.*

cleft extending from the nostril to the first labial; internasal single or divided; loreal present. Body stout, cylindrical; scales distinctly striated and keeled, in 37 to 47 rows, without apical pits; ventrals well developed, not keeled; tail moderate; subcaudals in two rows.

A single species.

464. Homalopsis buccata.

Russell, Ind. Serp. ii, pl. xxxiii.
Coluber buccatus, *Linn. Syst. Nat.* i, p. 377.
Homalopsis buccata, *Schleg. Phys. Serp.* ii, p. 337, pl. xiii, figs. 1–3; *Cantor, J. A. S. B.* xvi, 1847, p. 943; *Dum. & Bibr. Erp. Gén.* vii, p. 968; *Günth. Rept. B. I.* p. 285; *Theob. Cat.* p. 185.
Homalopsis hardwickii, *Gray, Zool. Misc.* p. 65.
Homalopsis semizonata, *Blyth, J. A. S. B.* xxiv, 1855, p. 187.
Pythonia semizonata, *Blyth, J. A. S. B.* xxviii, 1859, p. 297.

Frontal usually broken up into several shields, not much broader than the supraocular; parietals short; loreal sometimes divided into two; one or two præ- and two postoculars; 1 to 3 suboculars sometimes present; temporals small, scale-like; upper labials 10 to 12, fifth or sixth usually entering the eye; two or three pairs of chin-shields in a transverse row, inner in contact with the 3 first lower labials. Scales in 37 to 47 rows. Ventrals 160–171; anal divided; subcaudals 70–85. Above with broad transverse dark brown, black-edged cross bands separated by narrow pale brown interspaces, which are whitish in the young; head pale, with a triangular or V-shaped dark brown mark on the snout, a Λ-shaped mark on the vertex, and a dark brown band on each side, beginning in front of the eye and passing through it; belly whitish, with a series of dark brown spots along each side; tail brown-spotted beneath.

Total length 3½ feet; tail 9 inches.

Hab. Pegu, Tenasserim, Camboja, Malay Peninsula, Sumatra, Borneo, Java.

According to Cantor, this snake inhabits small streams, tanks, and flooded fields, is of gentle disposition, sluggish in its movements, and very awkward on dry land.

Genus CERBERUS,

Cuvier, Règne Animal, 2nd ed. ii, p. 81, 1829.

Maxillary teeth 12 to 16, followed by two grooved fangs. Head small, not distinct from neck; eye small, with vertically elliptical pupil; snout covered with shields, occiput with scales; nasals semidivided, the cleft extending from the nostril to the first labial, in contact behind the rostral; two small internasals (rarely united); loreal present. Body stout, cylindrical; scales strongly keeled, in 21 to 25 rows, without apical pits; ventrals well developed, not keeled; tail moderate, slightly compressed; subcaudals in two rows *.

A single species.

465. Cerberus rhynchops.

Russell, Ind. Serp. i, pl. xvii, and ii, pl. xl.
Hydrus rhynchops, *Schneid. Hist. Amph.* i, p. 246.

* Occasionally partly single, according to Cuvier.

Cerberus cinereus, *Cantor, P. Z. S.* 1839, p. 54.
Homalopsis australis, *Gray, Zool. Misc.* p. 65.
Homalopsis rhynchops, *Cantor, J. A. S. B.* xvi, 1847, p. 941.
Cerberus acutus, unicolor, *and* australis, *Gray, Cat. Sn.* p. 65.
Cerberus boæformis, *Dum. & Bibr. Erp. Gén.* vii, p. 978.
Cerberus rhynchops, *Günth. Rept. B. I.* p. 279; *Anders. P. Z. S.* 1871, p. 179; *Theob. Cat.* p. 185; *Murray, Zool. Sind,* p. 381.

Rostral nearly as deep as broad; eye between five or six shields, viz. a supraocular, a præocular, two or three suboculars, and a postocular; 9 or 10 upper labials, posterior transversely divided; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields smaller and wedged in between the anterior and the labials. Scales strongly keeled, in 21 to 25 rows. Ventrals 132–156; anal divided; subcaudals 49–72. Grey, olive, or blackish above, with more or less distinct black cross bars; sometimes a more or less distinct white lateral band; lower parts whitish, with large black blotches or cross bars.

Total length 3 feet 3 inches; tail 7 inches.

Hab. India, extending west to the Indus, and Ceylon, Burma, Indo-China, Malay Peninsula and Archipelago, New Guinea, north coast of Australia. This snake lives in the mud on the banks of large rivers and estuaries, and on the sea-coast, having the power of accommodating itself to fresh and salt water. It feeds on fish, and is very gentle.

Genus **HYPSIRHINA,**

Wagler, Syst. Amph. p. 169, 1830.

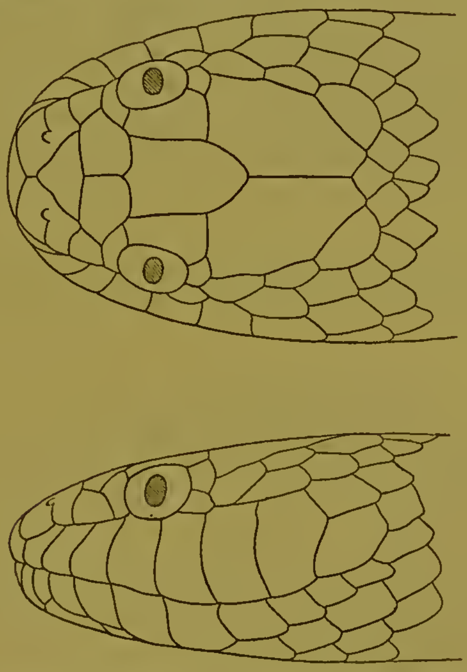

Fig. 110.—Head of *Hypsirhina plumbea.*

Maxillary teeth 10 to 15, followed by two grooved fangs. Head not or but slightly distinct from neck; eye small, with vertically

elliptical pupil; head-shields large; nasal semidivided, the cleft extending from the nostril to the first labial, in contact behind the rostral; internasal single or divided; loreal present. Body stout, cylindrical; scales smooth, in 19 to 31 rows, without apical pits; tail moderate; subcaudals in two rows.

Distribution. Seven or eight species are known, from the East Indies and Southern China. Four occur in India and Burma.

Synopsis of Indian and Burmese Species.

Scales in 19 rows .... *H. plumbea*, p. 376.
Scales in 21 rows .... *H. enhydris*, p. 376.
Scales in 25 rows .... *H. blanfordii*, p. 377.
Scales in 29 or 31 rows .... *H. sieboldii*, p. 377.

466. Hypsirhina plumbea.

Homalopsis plumbea, *Boie, Isis*, 1827, p. 560; *Cantor, J. A. S. B.* xvi, 1847, p. 948.
Hypsirhina hardwickii, *Gray, Ill. Ind. Zool.* ii, pl. lxxxvii, fig. 1.
Hypsirhina plumbea, *Gray, Zool. Misc.* p. 66; *Günth. Rept. B. I.* p. 280; *Jan, Icon. Ophid.* 30, pl. v, fig. 2; *Theob. Cat.* p. 182.
Eurostus plumbeus, *Dum. & Bibr. Erp. Gén.* vii, p. 955, pl. lxxxiv, fig. 2.

Rostral much broader than deep; internasal single; frontal much longer than broad, as long as its distance from the end of the snout, a little shorter than the parietals; loreal as long as deep or deeper than long; one præ- and two postoculars; temporals 1+2; upper labials 8, fourth or fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are larger than the posterior. Scales in 19 rows. Ventrals 120–134; anal divided; subcaudals 29–46. Brownish or greyish olive above, uniform or with a vertebral series of small black spots; upper lip and lower parts white, usually with a black line along the middle of the tail.

Total length 15 inches; tail 3.

Hab. Burma, Southern China, Indo-China, Malay Peninsula and Archipelago.

467. Hypsirhina enhydris.

Russell, Ind. Serp. i, pl. xxx.
Hydrus enhydris, *Schneid. Hist. Amph.* i, p. 245.
Homalopsis olivaceus, *Cantor, P. Z. S.* 1839, p. 55.
Hypsirhina trilineata, bilineata, *and* furcata, *Gray, Zool. Misc.* p. 66.
Homalopsis enhydris, *Cantor, J. A. S. B.* xvi, 1847, p. 946.
Hypsirhina enhydris, *Dum. & Bibr. Erp. Gén.* vii, p. 946; *Günth. Rept. B. I.* p. 281, pl. xxii, fig. K; *Jan, Icon. Ophid.* 30, pl. iii, fig. 2, & pl. v, fig. 1; *Theob. Cat.* p. 183.

Rostral much broader than deep; internasal single; frontal nearly twice as long as broad, as long as its distance from the end

of the snout or shorter, as long as the parietals; loreal as long as deep or a little longer; one præ- and two postoculars; temporals 1+2; 8 upper labials, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are shorter than the posterior. Scales in 21 rows. Ventrals 159–169; anal divided; subcaudals 60–73. Brownish or olive above, with or without two light longitudinal bands; lower parts whitish, with a black line along each side of the ventrals, and usually a median black line or series of black dots.

Total length 2 feet 2 inches; tail 5 inches.

Hab. Bengal, Southern India and Ceylon, Burma, Southern China, Cochin China, Siam, Malay Peninsula and Archipelago.

According to Cantor, numbers of this species may be seen in rivers as well as in irrigated fields and estuaries, preying upon fishes, which, however, they refuse in a state of captivity. They are of timid and peaceful habits.

468. Hypsirhina blanfordii.

Hypsirhina maculata (*non D. & B.*), *Blanf. J. A. S. B.* xlviii, 1879, p. 130.
Hypsirhina maculosa, *Blanf. P. Z. S.* 1881, p. 226.

Head short, with broad, square, truncated snout; internasal single, nearly as long as broad; frontal fully twice as long as broad, a little shorter than the parietals; one præ- and two postoculars; temporals 1+2; upper labials 8, fourth entering the eye; only one pair of large chin-shields, the posterior pair scarcely exceeding the adjoining scales in size. Scales in 25 rows. Ventrals 125; anal divided; subcaudals 45. Colour blackish ashy, with a row of large, irregular-shaped black spots down the back, and another rather less in size, but each spot including several scales, down each side; a blackish band down the margins of the ventrals, caused by the dark edges of the shields and of the first row of scales on each side.

Total length 12 inches; tail 1·75.

Hab. Pegu, probably in the neighbourhood of Bassein. A single specimen is known, which I have not been able to examine.

469. Hypsirhina sieboldii.

Homalopsis sieboldii, *Schleg. Phys. Serp.* ii, p. 349, pl. xiii, figs. 4 & 5; *Cantor, J. A. S. B.* xvi, 1847, p. 945.
Ferania sieboldii, *Gray, Zool. Misc.* p. 67; *Günth. Rept. B. I.* p. 284; *Anders. P. Z. S.* 1871, p. 180; *Theob. Cat.* p. 184; *Murray, J. Bomb. N. H. Soc.* i, 1886, p. 219.
Trigonurus sieboldii, *Dum. & Bibr. Erp. Gén.* vii, p. 960.
Hypsirhina sieboldii, *Jan, Icon. Ophid.* 30, pl. iv, fig. 2.
Feranoides jamnætica, *Carlleyle, J. A. S. B.* xxxviii, 1869, p. 196.

Rostral nearly as deep as broad; two internasals; frontal as long as its distance from the end of the snout, as long as the

parietals; loreal as long as deep or a little deeper than long; one præocular, sometimes with a small subocular below; two postoculars; temporals small, 1+2; upper labials 7 or 8, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields; posterior chin-shields very small. Scales in 29 or 31 rows. Ventrals 147–156; anal divided; subcaudals 48–56. Whitish or pale brown above, with dark brown, black-edged elliptical or rhomboidal transverse spots broader than their interspaces; a series of round spots on each side, alternating with the dorsal spots; head with three dark brown longitudinal bands, confluent between the eyes; lower parts white, checkered with black.

Total length 2 feet; tail 4 inches.

Hab. A rare snake, hitherto recorded from Bombay, Agra, Bengal, Pegu, and the Province Wellesley.

Genus **FORDONIA**,

Gray, Zool. Misc. p. 67, 1842.

Maxillary teeth 7 or 8, followed by two small grooved fangs. Head small, not distinct from neck; eye very small, with vertically elliptical pupil; head-shields large; nostril in an undivided or semidivided nasal; a single internasal, separating the nasals; no loreal. Body stout, cylindrical; scales smooth, in 25 to 29 rows, without apical pits; ventrals well developed, not keeled; tail short, subcaudals all or part in two rows.

A single species.

470. **Fordonia leucobalia.**

Homalopsis leucobalia, *Schleg. Phys. Serp.* ii, p. 345, pl. xiii, figs. 8 & 9; *Cantor, J. A. S. B.* xvi, 1847, p. 949, pl. xl, fig. 5.
Fordonia unicolor, *Gray, Cat. Sn.* p. 77; *Günth. Rept. B. I.* p. 277; *Theob. Cat.* p. 182.
Hemiodontus leucobalia, *Dum. & Bibr. Erp. Gén.* vii, p. 884; *Jan, Icon. Ophid.* 28, pl. vi, fig. 1.
Hemiodontus chalybæus *, *Jan, l. c.* pl. vi, fig. 3.
Fordonia bicolor, *Theob. J. Linn. Soc.* x, 1868, p. 56; *id. Cat.* p. 181.

Frontal as long as broad or a little longer than broad, longer than its distance from the end of the snout, a little shorter than the parietals; one præ- and two postoculars; temporals 1+3; upper labials 5, third entering the eye; 3 lower labials in contact with the anterior chin-shields, which are small and a little larger than the posterior. Scales in 25 to 29 rows. Ventrals 130–156, last frequently divided; anal divided; subcaudals 26 to 41. Blackish or brown above, with (*F. leucobalia*) or without (*F. unicolor*) lighter spots, or brown with small black spots (*F. bicolor*), or yellow with black spots; lower parts yellowish.

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* Founded on a specimen in which the internasal is abnormally absent.

Total length 3 feet; tail 4·5 inches.

Hab. Rivers and coasts of Pegu, the Nicobars, the Malay Peninsula and Archipelago, Sumatra, Java, Cochinchina, New Guinea, and the north coast of Australia. At Pinang, Cantor says, it is numerous not only in fresh water and estuaries, but in the sea at some distance from the shore, where it is sometimes taken in fishing-nets. It is of sluggish, not fierce habits, and feeds upon fishes and crustaceans.

Genus GERARDIA,

Gray, Cat. Sn. p. 77, 1849.

Maxillary teeth 10, followed by two small grooved fangs. Head small, not distinct from neck; eye small, with vertically subelliptical pupil; head-shields large; nostril in the middle of an undivided nasal; a single internasal, separating the nasals; loreal present. Body elongate, cylindrical; scales smooth, in 17 rows, without apical pits; ventrals well developed, not keeled; tail moderate; subcaudals in two rows.

A single species.

471. Gerardia prevostiana.

Coluber (Homalopsis) prevostianus, *Eyd. & Gerv. in Guér. Mag. Zool.* Cl. iii, 1837, p. 5, pl. xv; *iid. Voy. Favorite*, v, *Zool.* p. 70, pl. xxix.

Gerarda bicolor, *Gray, Cat. Sn.* p. 77; *Günth. A. M. N. H.* (4) i, 1868, p. 421; *Theob. Cat.* p. 180.

Campylodon prevostianum, *Dum. & Bibr. Erp. Gén.* vii, p. 964; *Jan, Icon. Ophid.* 30, pl. vi, fig. 3; *F. Müller, Verh. nat. Ges. Basel*, vii, 1885, p. 700.

Heleophis flavescens, *F. Müller, t. c.* 1884, p. 286, pl. v, fig. 2.

Frontal a little longer than broad, shorter than its distance from the end of the snout, or than the parietals; loreal slightly longer than deep, a little smaller than the nasal; one præ- and two postoculars; temporals 1+2; upper labials 8, fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are much larger than the posterior. Scales in 17 rows. Ventrals 146–158; anal divided; subcaudals 31–34. Uniform dark olive above; three outer rows of scales whitish; upper lip white, rostral dark olive; ventrals and subcaudals whitish, with dark edges.

Total length 16 inches; tail 2.

Hab. Pegu *.

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* Theobald adds Ceylon to the habitat of this species, on the authority of Ferguson; but on referring to the source of his information, viz. Ferguson's 'Reptile Fauna of Ceylon,' a tract published for private distribution (Colombo, 1887), all we find is this:—" *Gerarda bicolor*, Gray. A single specimen from the Asiatic Society Museum, but I question if it be a Ceylon Snake." The fact

Genus CANTORIA,

Girard, Proc. Ac. Philad, 1857, p. 182.

Ten or eleven teeth in each maxillary, last longest and grooved. Head small, not distinct from neck; eye very small, with vertically subelliptical pupil; head-shields large; nostril in a semidivided nasal, the cleft of which extends to the præfrontal; a single inter-

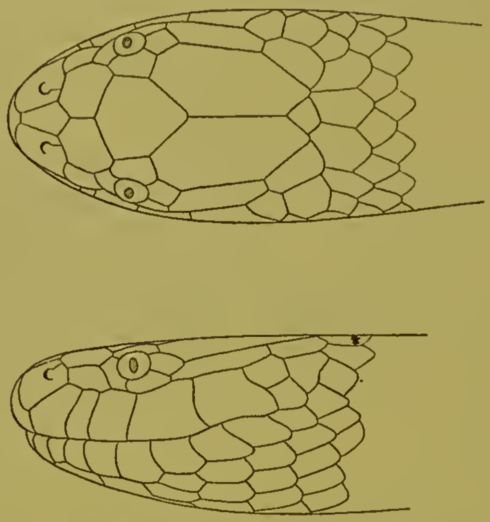

Fig. 111.—Head of *Cantoria violacea.*

nasal, separating the nasals; loreal present. Body very elongate, slightly compressed; scales smooth, in 19 rows, without apical pits; ventrals well developed, not keeled; tail moderate; subcaudals in two rows.

A single species.

472. Cantoria violacea.

Cantoria violacea, *Girard, Proc. Ac. Philad.* 1857, p. 182; *id. U. S. Explor. Exped., Herp.* p. 156, pl. xi, figs. 7-10; *Cope, Proc. Ac. Philad.* 1866, p. 312; *Lütk. Vid. Meddel.* 1866, p. 151.
Hydrodipsas elapiformis, *Peters, MB. Ak. Berl.* 1859, p. 270, pl.—, fig. 1.
Cantoria elongata, *Günth. Rept. B. I.* p. 277.
Hemiodontus elapiformis, *Jan, Icon. Ophid.* 28, pl. vi, fig. 2.
Cantoria elapiformis, *Günth. Zool. Rec.* 1868, p. 124.
Cantoria dayana, *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 208, pl. xi, fig. 5; *Anders. P. Z. S.* 1871, p. 178; *Theob. Cat.* p. 181.

Frontal a little longer than broad, shorter than its distance from the end of the snout or than the parietals; eye between four shields,

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that Eydoux's *Coluber prevostianus* was described together with the Ceylonese *Uropeltis philippinus* as from Manilla would suggest the possibility of the former having likewise been obtained from Ceylon; however, there is no evidence of this being the case, and Pegu remains the only authenticated habitat. Theobald's specimens were obtained from the Bassein River.

a præocular, a supraocular, a postocular, and a subocular; loreal longer than deep; one elongate anterior temporal, in contact with the postocular and the subocular; 5 upper labials; 3 lower labials in contact with the anterior chin-shields, which are not longer than the posterior. Scales in 19 rows. Ventrals 266–278; anal divided; subcaudals 56–64. Blackish above, with white transverse bands, which widen towards the abdomen; these bands are very narrow in the typical form, wider in the var. *dayana*, but constantly much narrower than the black interspaces; some white spots on the head; lower parts white, with greyish spots, the continuation of the dorsal cross bands; these bands may form complete rings on the tail.

Total length 3 feet; tail 4 inches.

Hab. Singapore, Borneo, and mouth of the Moulmein River, where a single specimen was caught by Dr. Stoliczka in brackish water. The latter differs somewhat in coloration, having the white bands considerably broader; but as it agrees absolutely in structure with the typical form, I cannot regard it as more than a colour variety. A second specimen from an unknown locality, agreeing with Dr. Stoliczka's description in every respect, is in the British Museum.

Genus **HIPISTES**,

Gray, Cat. Sn. p. 77, 1849.

Maxillary teeth 8 or 9, followed by two small grooved fangs. Head small, not distinct from neck; lower border of rostral not notched; eye extremely small, with vertically elliptical pupil; head-shields small, parietals broken up into numerous shields; nostril a

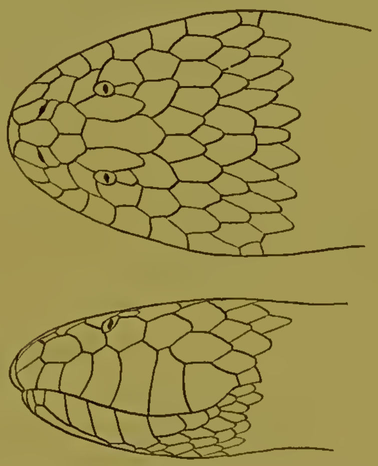

Fig. 112.—Head of *Hipistes hydrinus*.

transverse slit between two nasals; a single internasal, separating the nasals; a loreal. Body elongate, slightly compressed; scales smooth, in 35 to 42 rows, juxtaposed or subimbricate, without apical pits; ventrals narrow, with two sharp keels; tail short, feebly compressed; subcaudals in two rows.

A single species.

473. Hipistes hydrinus.

Homalopsis hydrina, *Cantor, J. A. S. B.* xvi, 1847, p. 951, pl. xl, fig. 4.
Bitia hydroides *and* Hipistes fasciatus, *Gray, Cat. Sn.* pp. 63, 78.
Hipistes hydrinus, *Günth. Rept. B. I.* p. 287, pl. xxiv, fig. H; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 207; *Anders. P. Z. S.* 1871, p. 181; *Theob. Cat.* p. 184.

Rostral as deep as broad; frontal narrow, twice as long as broad, as long as its distance from the end of the snout or a little longer; eye between four shields, viz. a supraocular, a præocular, a subocular, and a small postocular; 7 upper labials; 5 lower labials in contact with the anterior chin-shields; posterior chin-shields extremely small. Scales in 35 to 42 rows. Ventrals 153–165; anal divided; subcaudals 22–35. Pale grey or brownish above, with black cross bands as broad as the interspaces between them or narrower; lower parts white.

Total length 19 inches; tail 2.

Hab. This is the most Hydrophid-like of the Homalopsids. Of the three specimens observed by Cantor, two were captured in fishing-stakes placed in the sea off the shores of Keddah, the third was washed on shore by the waves on the coast of Pinang. Stoliczka found it very common at the mouth of the Moulmein River; and, according to Theobald, it is largely captured in company with great numbers of Hydrophids in the sluice-nets (or creels) in the Bassein River below Gnaputau. It lives almost entirely upon fish.

Series C. PROTEROGLYPHA.

Anterior maxillary teeth grooved. Poisonous.

Subfamily V. ELAPINÆ.

Terrestrial or arboreal. Tail cylindrical.

These snakes inhabit Asia, Africa, and America, and form the bulk of the Ophidian fauna of Australia.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. No solid maxillary teeth; scales equal.
  a. Poison-gland not extending along the body .... CALLOPHIS, p. 383.
  b. Poison-gland extending along each side of the anterior third of the body ...... ADENIOPHIS, p. 386.
B. Poison-fang followed by one or more solid teeth.
  a. Neck not dilatable; vertebral scales enlarged .... BUNGARUS, p. 387.
  b. Neck dilatable; vertebral scales not enlarged .... NAIA, p. 390.

Genus CALLOPHIS,

Gray, Ill. Ind. Zool. ii, 1834 (name only); Günth. P. Z. S. 1859, p. 81.

Poison-fangs with a distinct groove anteriorly; no solid maxillary teeth. Head not distinct from neck, with large shields; no loreal. Eye small, with round pupil. Body cylindrical, slender. Scales smooth, equal, in 13 rows. Tail short; subcaudals in pairs.

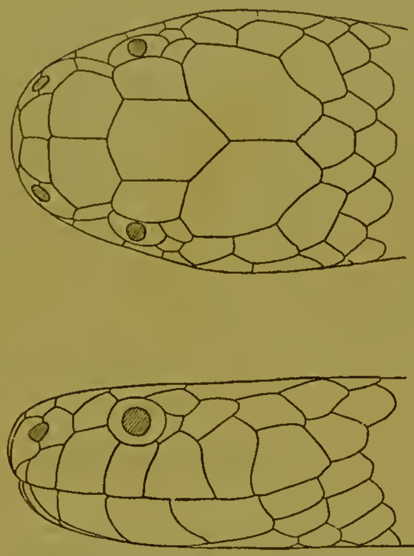

Fig. 113.—Head of *Callophis macclellandii.*

Distribution. East Indies, Southern China, and Japan. Seven species are known, five of which occur in India and Burma.

This genus differs from the South-African and Tropical-American *Elaps* in the presence of a groove along the entire length of the maxillary fangs and in having postfrontal bones. It is completely connected with *Bungarus* through *Hemibungarus*, Peters, in which a solid tooth is present behind the poison-fangs.

Synopsis of Indian and Burmese Species.

A. One præ- and two postoculars.
- *a.* Six upper labials.................... *C. trimaculatus*, p. 384.
- *b.* Seven upper labials.
  - *a'.* A single temporal shield; anterior chin-shields in contact with 4 or 5 lower labials.
    - *a''.* Subcaudals 21–32.............. *C. maculiceps*, p. 384.
    - *b''.* Subcaudals 33–44.............. *C. nigrescens*, p. 384.
  - *b'.* Temporals 1+1; anterior chin-shields in contact with 3 labials .. *C. macclellandii*, p. 385.

B. No præocular; one postocular.......... *C. bibronii*, p. 386.

474. Callophis trimaculatus.

Russell, Ind. Serp. i, pl. viii.
Vipera trimaculata, *Daud. Rept.* vi, p. 25.
Coluber melanurus, *Shaw, Zool.* iii, p. 552.
Elaps melanurus, *Jerd. J. A. S. B.* xxii, 1853, p. 522.
Callophis trimaculatus, *Günth. P. Z. S.* 1859, p. 83, pl. xvi, fig. E; *id. Rept. B. I.* p. 350; *Theob. Cat.* p. 212; *Phipson, J. Bomb. N. H. Soc.* ii, 1887, p. 248.

Rostral nearly as deep as broad; frontal as long as its distance from the end of the snout, much shorter than the parietals; one præ- and two postoculars; a single temporal; 6 upper labials, third and fourth entering the eye; two pairs of subequal chin-shields, the anterior in contact with 3 or 4 labials. Scales in 13 rows. Ventrals 258–274; anal divided; subcaudals 24–35. Light bay above, each scale with a brown dot; sometimes a fine dark vertebral line; head and nape black, with a yellow spot on each side of the occiput; lower parts uniform red; tail with two black rings.

Total length 13 inches; tail 1 inch.

Hab. Tenasserim, Bengal?, Jálna (Deccan), Bombay, Southern India.

475. Callophis maculiceps.

Elaps melanurus (*non Shaw*), *Cantor, J. A. S. B.* xvi, 1847, p. 1027, pl. xl, fig. 6.
Elaps maculiceps, *Günth. Cat. Col. Sn.* p. 232.
Callophis maculiceps, *Günth. P. Z. S.* 1859, p. 84, pl. xvi, fig. D; *id. Rept. B. I.* p. 351; *Theob. Cat.* p. 213.

Rostral broader than long; frontal as long as its distance from the end of the snout, much shorter than the parietals; one præ- and two postoculars; a single temporal; 7 upper labials, third and fourth entering the eye; two pairs of subequal chin-shields, the anterior in contact with 4 or 5 labials. Scales in 13 rows. Ventrals 205–247; anal divided; subcaudals 21–32. Light bay above, with a distinct series of black dots along each side of the back; head and nape black, with one or two yellow bands on each side; lower parts red; tail with two black rings.

Total length 19 inches; tail 1 inch 4 lines.

Hab. Malay Peninsula, Tenasserim, Pegu, Cochinchina.

476. Callophis nigrescens.

Callophis nigrescens, *Günth. A. M. N. H.* (3) ix, 1862, p. 131; *id. Rept. B. I.* p. 351, pl. xxiv, fig. F; *Theob. Cat.* p. 213; *Phipson, J. Bomb. N. H. Soc.* ii, 1887, p. 248.
? Elaps malabaricus, *Jerdon, J. A. S. B.* xxii, 1853, p. 522.
Callophis concinnus, *Beddome, Madras Journ. Med. Sc.* 1863.
Callophis pentalineatus, *Beddome, Madras Journ. Med. Sc.* 1871; *Theob. Cat.* p. 214.

Rostral broader than long; frontal as long as its distance from the end of the snout, much shorter than the parietals; one præ- and two postoculars; a single temporal; 7 upper labials, third and fourth entering the eye; anterior chin-shields as long as the posterior or a little shorter, in contact with four labials. Scales in 13 rows. Ventrals 232–251; anal usually divided; subcaudals 33–44. This species comprises four principal colour varieties, which are connected by insensible gradations; in all the head and nape are black, with an oblique yellow band, sometimes broken up into spots, on each side from the parietals to behind the angle of the mouth, and the upper lip is yellow in front of and behind the eye; lower parts uniform red.

A. Dark purplish brown above, with three or five longitudinal series of black, light-edged spots.
B. The spots confluent and forming three longitudinal black bands edged with whitish.
C. As in the preceding, but the black bands without light edges.
D. Pale reddish brown or red above, with five black longitudinal bands.

Total length $3\frac{1}{2}$ feet; tail 4·5 inches.

Hab. Bombay Hills (Karwar), Wynaad, Nilgiris, Anaimalai and Travancore Hills, 4000–6000 feet.

477. Callophis macclellandii.

Elaps macclellandii, *Reinh. Calc. Journ. N. H.* iv, 1844, p. 532; *id. Vidensk. Meddel.* 1860, p. 247.
Elaps personatus, *Blyth, J. A. S. B.* xxiii, 1855, p. 298.
Elaps univirgatus, *Günth. Cat. Col. Sn.* p. 231.
Callophis univirgatus, *Günth. P. Z. S.* 1859, p. 83, pl. xvii.
Callophis macclellandii, *Günth. P. Z. S.* 1861, p. 219; *id. Rept. B. I.* p. 349; *Theob. Cat.* p. 214.
Callophis annularis, *Günth. Rept. B. I.* p. 350, pl. xxiv, fig. J*; *Theob. l. c.* p. 212.

Rostral broader than long; frontal as long as its distance from the end of the snout or a little longer, as long as the parietals; one præ- and two postoculars; temporals 1+1; upper labials 7, third and fourth entering the eye; two pairs of small subequal chin-shields, anterior in contact with 3 labials. Scales in 13 rows. Ventrals 182–224; anal divided; subcaudals 25–34. Reddish brown above, with regular, equidistant, black, light-edged transverse bars or rings; belly yellowish, with black cross bands or quadrangular spots. A variety from Nepal and Darjeeling (*C. univirgata*, Gthr.) is distinguished by the presence of a black vertebral line; the transverse bars are replaced by transverse spots or are altogether absent.

Total length 26 inches; tail 2·3.

Hab. Nepal, Sikhim, Assam, Burma, Southern China.

* An anomalous specimen with six labials on one side.

478. Callophis bibronii.

Elaps bibroni, *Jan, Rev. et Mag. Zool.* x, 1858, p. 526; *id. Icon. Ophid.* 43, pl. ii, fig. 1.
Elaps cerasinus, *Beddome, P. Z. S.* 1864, p. 179.
Callophis cerasinus, *Beddome, Madras Journ. Med. Sc.* 1867, p. 16, pl. ii, fig. 5; *Theob. Cat.* p. 213.

Rostral broader than long; frontal nearly as long as its distance from the end of the snout, much shorter than the parietals; no præocular; præfrontal in contact with the third labial; one very small postocular; temporals 1+1; upper labials 7, third and fourth entering the eye; first lower labial much elongate, forming a long suture with its fellow; anterior chin-shields small, much shorter than the posterior, in contact with the third and fourth labials. Scales in 13 rows. Ventrals 222–226; anal entire; subcaudals 27–34. Cherry-red, with black transverse bands above, which are sometimes continuous across the belly; in some specimens the back is of a dark purplish brown; anterior part of head black above.

Total length 25 inches; tail 2.

Hab. Wynaad, 3000 feet.

Genus ADENIOPHIS,

Peters, MB. Ak. Berl. 1871, p. 578.

Characters of *Callophis*, except that the poison-glands, instead of being confined to the temporal region, extend along each side of the body for about one third of its length, gradually thickening and terminating in front of the heart with club-shaped ends. The presence of this gland may be detected without dissecting the animal, by the thickening of the cardiac region in the second third of the body, the heart being shifted further back than in other snakes, owing to the extension of the glands.

Experiments on the action of the poison of *Adeniophis* are much to be desired.

Only two species are known, viz. *A. intestinalis*, Laur., comprising several colour varieties, which have received special binomials recorded below under the synonymy of the species, and *A. bivirgatus*, Boie (*flaviceps*, Cant., *quadrivirgatus*, Jan, *tetratænia*, Blkr.), which inhabits the Malay Archipelago and Pinang.

479. Adeniophis intestinalis.

Russell, Ind. Serp. ii, pl. xix.
Aspis intestinalis, *Laur. Syn. Rept.* p. 106.
Elaps furcatus, *Schneid. Hist. Amph.* ii, p. 303; *Dum. & Bibr. Erp. Gén.* vii, p. 1228; *Jan, Icon. Ophid.* 43, pl. i, fig. 3.
Maticora lineata, *Gray, Ill. Ind. Zool.* ii, pl. lxxxvi, figs. 4, 5.
Elaps intestinalis, *Cantor, J. A. S. B.* xvi, 1847, p. 1028.
Elaps trilineatus, *Dum. & Bibr. t. c.* p. 1227.

Callophis intestinalis, *Günth. P. Z. S.* 1859, p. 82, pl. xvi; *id. Rept. B. I.* p. 348; *Meyer, MB. Ak. Berl.* 1869, p. 204, pls. i & ii; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 212; *Theob. Cat.* p. 211.
Adeniophis nigrotæniatus, *Peters, MB. Ak. Berl.* 1871, p. 578.
Callophis macclellandii (*non Reinh.*), *Fayrer, Thanatoph.* pl. x.

Frontal longer than its distance from the end of the snout, as long as the parietals or a little shorter; one præ- and two postoculars; temporals 1+2; upper labials 6, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. Scales in 13 rows. Ventrals 223–273; anal entire; subcaudals 15–28. The Burmese and Malay specimens belong to a variety (*lineata*, Gray) which is brown above with a yellowish (red?) vertebral line edged with black, and a light, black-edged line along each side; belly with alternate yellow and black cross bands.

Total length 2 feet; tail 1½ inch.

Hab. Burma, Malay Peninsula and Archipelago. Günther mentions a specimen from Malwa, Central India.

Genus BUNGARUS,

Daudin, Hist. Rept. v. p. 263, 1803.

Poison-fangs with a distinct groove anteriorly, followed by one to three small solid teeth. Head not distinct from neck, with large shields; no loreal. Eye small, with round pupil. Scales smooth, in 13 or 15 rows; vertebral row enlarged, hexagonal. Tail moderate or short; subcaudals in a single or double row.

Distribution. East Indies and Southern China. Of the eight known species, five are found in India and Ceylon.

The "Bungarums" are thoroughly terrestrial; their bite is very dangerous. They feed chiefly on small mammals, lizards, and snakes.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. ~~Ventral~~ Vertebral scales much enlarged, broader than long.
  a. Subcaudals single.
    a′. A dorsal ridge; tail ending very obtusely; anterior temporal shield scarcely longer than deep . . . . *B. fasciatus*, p. 388.
    b′. No dorsal ridge; tail tapering to a point; anterior temporal much longer than deep.
      a″. Frontal little longer than broad . . . . *B. ceylonicus*, p. 388.
      b″. Frontal much longer than broad . . *B. cæruleus*, p. 388.
  b. Subcaudals in pairs, or only a few of the anterior single . . . . *B. bungaroides*, p. 89.
B. Vertebral scales feebly enlarged . . . . *B. lividus*, p. 389.

480. Bungarus fasciatus.

Russell, Ind. Serp. i, pl. iii.
Pseudoboa fasciata, *Schneid. Hist. Amph.* ii, p. 283.
Bungarus annularis, *Daud. Rept.* v, p. 265, pl. lxv; *Dum. & Bibr. Erp. Gén.* vii, p. 1269; *Blyth, J. A. S. B.* xviii, p. 791; *Jan, Icon. Ophid.* 44, pl. ii, fig. 3.
Bungarus fasciatus, *Cantor, J. A. S. B.* xvi, 1847, p. 1034; *Günth. Rept. B. I.* p. 343; *Fayrer, Thanatoph.* pl. ix; *Theob. Cat.* p. 216.

Rostral much broader than deep, visible from above; frontal longer than broad, as long as or longer than its distance from the end of the snout, as long as or a little shorter than the parietals; one præ- and two postoculars; temporals 1+2, anterior scarcely longer than deep; 7 upper labials, third and fourth entering the eye; two pairs of short, subequal chin-shields. An obtuse keel or ridge along the back and tail, the latter ending very obtusely. Scales in 15 rows, vertebrals much enlarged, broader than long. Ventrals 200–234; anal entire; subcaudals single, 32–39. Bright yellow, with black annuli as broad as the interspaces between them or broader; a black band, widening behind, on the head and nape, beginning between the eyes; snout brown.

Total length 4 feet; tail 5 inches. Grows to 6 feet or more.

Hab. Bengal, Southern India, Assam, Burma, Southern China, Indo-China, Malay Peninsula, Sumatra, Java. The "Ráj-sámp" of Northern India.

481. Bungarus ceylonicus.

Bungarus ceylonicus, *Günth. Rept. B. I.* p. 344; *Theob. Cat.* p. 216.

Rostral a little broader than deep, just visible from above; frontal a little longer than broad, as long as its distance from the end of the snout or a little shorter, much shorter than the parietals; one præ- and two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; two pairs of short, subequal chin-shields, the anterior in contact with 3 labials. Scales in 15 rows; vertebrals much enlarged, broader than long. Ventrals 224–235; anal entire; subcaudals single, 35–40. Black, with whitish annuli which may be very indistinct or broken up into spots on the back in the adult; lower parts uniform white in the young.

Total length 3 feet 3 inches; tail 4 inches.

Hab. Ceylon; and, according to Theobald, Southern India (Palamcottah).

482. Bungarus cæruleus.

Russell, Ind. Serp. i, pl. i.
Pseudoboa cærulea, *Schneid. Hist. Amph.* ii, p. 284.
Pseudoboa krait, *Schneid. l. c.* p. 288.
Bungarus cæruleus, *Daud. Rept.* v, p. 270; *Dum. & Bibr. Erp. Gén.* vii, p. 1273; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 209; *Jan, Icon.*

Ophid. 44, pl. iii, figs. 2 & 3; *Fayrer, Thanatoph.* pl. x; *Murray, Zool. Sind*, p. 387.
Bungarus candidus, *Cantor, J. A. S. B.* xvi, 1847, p. 1034.
Bungarus arcuatus, *Dum. & Bibr. t. c.* p. 1272.
Bungarus cæruleus, part., *Günth. Rept. B. I.* p. 343; *Theob. Cat.* p. 215.

Rostral broader than deep, visible from above; frontal longer than broad, as long as its distance from the end of the snout, shorter than the parietals; one præ- and two postoculars; temporals 1+1 or 1+2; upper labials 7, third and fourth entering the eye; two pairs of subequal chin-shields, anterior in contact with 3 labials. Scales in 15 rows; vertebrals much enlarged, broader than long on the hinder half of the body. Ventrals 200–220; anal entire; subcaudals 40–51. Dark brown or bluish-black above, with narrow transverse white streaks, or with small white spots; lower parts uniform white.

Total length 3 feet 2 inches; tail 5 inches. Grows to 4½ feet.

Hab. This species, called "Krait" in Northern India, is common all over India, and very destructive of life; it is rare in Burma.

483. Bungarus bungaroides.

Elaps bungaroides, *Cantor, P. Z. S.* 1839, p. 33.
Xenurelaps bungaroides, *Günth. Rept. B. I.* p. 345; *Jerdon, P. A. S. B.* 1870, p. 82; *Theob. Cat.* p. 215; *Blanf. J. A. S. B.* xxxviii, 1879, pt. 2, p. 131.

Rostral a little broader than deep, just visible from above; frontal a little longer than broad, longer than its distance from the end of the snout, shorter than the parietals; one præ- and two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; two pairs of short, subequal chin-shields, the anterior in contact with 3 labials. Scales in 15 rows; vertebrals much enlarged, broader than long on the hinder half of the body. Ventrals 220–237; anal entire; subcaudals 44–51, all in pairs, or a few of the anterior single. Black, with white (yellow?) transverse lines, the anterior angular and pointing forwards; these lines widen beneath, forming broad bands across the belly; a yellow line across the snout, and a curved one on each side, from the frontal shield to behind the angle of the mouth; a third from the postoculars to the lip.

Total length 32 inches; tail 4.

Hab. A rare snake, known from the Khási Hills and Darjeeling (6800 feet).

484. Bungarus lividus.

Bungarus lividus, *Cantor, P. Z. S.* 1839, p. 32; *id. J. A. S. B.* xvi, 1847, p. 1034.
Bungarus cæruleus, part., *Günth. Rept. B. I.* p. 343; *Anders. P. Z. S.* 1871, p. 189; *Theob. Cat.* p. 215.

Rostral nearly as deep as broad, visible from above; frontal longer than broad, as long as its distance from the end of the snout, shorter than the parietals; one præ- and two postoculars; temporals 1+2; upper labials 7, third and fourth entering the eye; two pairs of chin-shields, anterior longest and in contact with 3 labials. Scales in 15 rows; vertebrals but feebly enlarged and not broader than long. Ventrals 212–225; anal entire; subcaudals single, 37–56. Uniform black or brown above; upper lip white; lower parts white or pale brown.

Total length 3 feet; tail 4 inches.

Hab. Assam.

Genus **NAIA**,

Laurenti, Syn. Rept. p. 90, 1768.

Poison-fangs with a distinct groove anteriorly, followed by one to three small solid teeth. Head distinct from neck, with large shields; no loreal. Eye rather small, with round pupil. Neck dilatable. Body cylindrical; scales disposed obliquely, smooth, in 15 or more rows. Tail moderate; subcaudals in a single or double row.

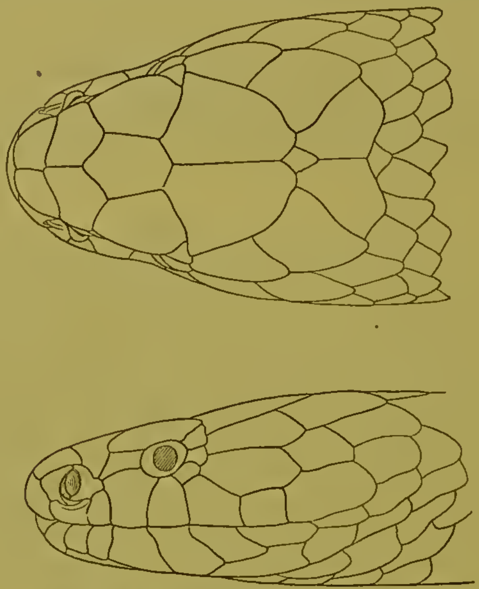

Fig. 114.—Head of *Naia bungarus.*

Distribution. Africa and Southern Asia. Oviparous. Terrestrial, but often ascending trees, and readily entering the water.

Six or seven species may be distinguished, of which three occur in the Indian Region:—

A. No large shields behind parietals.
- *a.* 23–27 scales across neck, 19–23 across middle of body; subcaudals 49–75, all in pairs . . . . *N. tripudians*, p. 391.
- *b.* 19–23 scales across neck, 17 across middle of body; subcaudals 43–52, some of the anterior frequently single . . . . [(Java & Borneo). *N. sputatrix*, Reinw.

B. A pair of large shields behind parietals; 19–21 scales across neck, 15 across middle of body; subcaudals 80–107, anterior usually single .... *N. bungarus*, p. 392.

485. Naia tripudians.

Russell, Ind. Serp. i, pls. v & vi, and ii, pl. i.
Coluber naia, *Linn. Syst. Nat.* i. p. 382.
Naia lutescens, *Laur. Syn. Rept.* p. 91; *Cantor, J. A. S. B.* xvi, 1847, p. 1038.
Naia tripudians, *Merr. Tent.* p. 147; *Gray, Ill. Ind. Zool.* ii, pls. lxxvii–lxxix; *Dum. & Bibr. Erp. Gén.* vii, p. 1293; *Günth. Rept. B. I.* p. 338; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 211; *Fayrer, Thanatoph.* pls. i–vi; *Jan, Icon. Ophid.* 45, pl. i, fig. 3; *Theob. Cat.* p. 208; *Blanf. J. A. S. B.* l, 1881, p. 241; *Murray, Zool. Sind,* p. 387; *Boettg. Zool. Jahrb.* iii, 1888, p. 943.
Tomyris oxiana, *Eichw. Zool. Spec.* iii, p. 171, *and Faun. Casp.-Cauc.* p. 130, pl. xx.
Naia larvata, *Cantor, P. Z. S.* 1839, p. 32.
Naia atra, *Cantor, A. M. N. H.* ix, 1842, p. 482.
Naia oxiana, *Strauch, Bull. St. Pétersb.* xiii, 1868, p. 87; *Bouleng. Tr. Linn. Soc.* (2) v, 1889, p. 103, pl. xi, fig. 2.

Fig. 115.—*Naia tripudians.*

Rostral a little broader than deep, visible from above; inter-

nasal in contact with the præocular; frontal as long as its distance from the rostral or a little longer, much shorter than the parietals; one præocular; three (rarely two) postoculars; temporals 2+3 or 2+4; upper labials 7, third deepest, seventh longest, third and fourth entering the eye; 4 lower labials in contact with the anterior chin-shields, which are as long as the posterior. 23 to 27 scales across the "neck," 19 to 23 across the middle of the body. Ventrals 170–206; anal entire; subcaudals 49–75. The colour varies extremely: upper parts greyish, brown, or black, with or without a spectacle- or loop-shaped black light-edged marking on the neck, or with light spots or cross bands on the body; whitish, brown, or blackish beneath, sometimes with black cross bands on the anterior part of the body.

The largest specimen in the British Museum measures 6 feet 4 inches, the tail one foot.

The Cobra or Naga is the best known and most deadly snake of India. Its habit of expanding the neck when irritated gives it a most peculiar appearance, with which everyone interested in natural history is familiar. It is the snake usually exhibited by Snake-charmers. It is found all over India and Ceylon, Burma, the Andamans, Southern China, Indo-China, and the Malay Peninsula and Archipelago; in the Himalayas it extends to an altitude of 8000 feet; to the west it ranges to Afghanistan, North-eastern Persia and Southern Turkestan, as far as the eastern coast of the Caspian Sea.

486. Naia bungarus.

Naia bungarus, *Schleg. Phys. Serp.* ii, p. 476, pl. xvii, figs. 8 & 9; *Schleg. & Müll. Verh. Overz. Bez. Nederl. Ind., Rept.* p. 71, pl. x.
Hamadryas hannah, *Cantor, As. Res.* xix, 1836, p. 87, pls. x–xii.
Hamadryas ophiophagus, *Cantor, P. Z. S.* 1838, p. 73, 1839, p. 32; *id. J. A. S. B.* xvi, 1847, p. 1037.
Naia vittata, *Elliot, Madras Journ. L. S.* xi, 1840, p. 39, pl. i.
Trimeresurus ophiophagus, part., *Dum. & Bibr. Erp. Gén.* vii, p. 1245.
Hamadryas elaps, *Günth. Cat. Col. Sn.* p. 219 *.
Trimeresurus bungarus, *Jan, Rev. et Mag. Zool.* 1859, p. 129; *id. Icon. Ophid.* 44, pl. iv.
Ophiophagus elaps, *Günth. Rept. B. I.* p. 341; *Anders. P. Z. S.* 1871, p. 188; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 210, pl. xi, fig. 7; *Fayrer, Thanatoph.* pls. vii & viii.
Naja elaps, *Theob. Cat.* p. 209.

Rostral much broader than deep, visible from above; internasal separated from the præocular; frontal nearly as long as its distance from the end of the snout, much shorter than the parietals, which are followed by a pair of large shields; one præocular (rarely two); three postoculars; temporals 2+2; upper labials 7, third deepest, seventh longest, third and fourth entering the eye;

* *Naia elaps*, Schleg., = *Dicmenia ikahcka*, Lesson, as pointed out by Jan in 1859, and again in 1878 by Peters and Doria.

4 lower labials in contact with the anterior chin-shields, which are as long as the posterior or a little longer. 19 or 21 scales across the neck, 15 across the middle of the body. Ventrals 215–262; anal entire; subcaudals 80–117, the anterior usually single. Yellowish brown, or olive, with more or less marked dark cross bands; young usually black, with yellow rings on the body and yellow cross bands on the head, sometimes covered above with light spots and with whitish black-edged ventral and subcaudal shields.

The largest specimen in the British Museum measures 13 feet, the tail being about one fifth the total length.

From its larger size and fiercer habits this snake is still more dangerous than the Cobra; it is fortunately less common. It inhabits Southern India, Orissa, Bengal, Assam, Burma, the Andamans, Siam, the Malay Peninsula, Java, Borneo, Sumatra, and the Philippines. It feeds principally on snakes.

Subfamily VI. HYDROPHIINÆ.

Marine. Tail strongly compressed, with the neural spines and hypapophyses very much developed.

Sea-snakes are easily recognized by their strongly compressed oar-shaped tail. With the exception of *Platurus*, which in many respects approaches the *Elapinæ*, they never leave the water. They are viviparous. Their home is essentially the coasts of the Indian Ocean and the tropical parts of the Western Pacific, from the Persian Gulf to New Guinea and North Australia; one species, however (*Hydrus platurus*), ranges from West and South Africa to the western coast of tropical America, as far north as Japan and Peter the Great Bay, Manchuria, and as far south as New Zealand.

Of the nine genera, six occur on the Indian and Burmese coasts.

Synopsis of Indian and Burmese Genera.

A. Only the poison-fangs are grooved.
- *a.* Mental shield triangular; no mental groove.
  - *a'.* Nostrils lateral; maxillary bone much shorter than transpalatine; a single small solid maxillary tooth (Fig. 116, *A.*); ventral shields large .... PLATURUS, p. 394.
  - *b'.* Nostrils on top of snout
    - *a''.* Maxillary slightly longer than transpalatine; 2 to 5 solid teeth on each maxillary (Fig. 116, *B.*); body short; snout short .... ENHYDRIS, p. 396.
    - *b''.* Maxillary much longer than transpalatine; 7 or 8 solid teeth on each maxillary (Fig. 116, *C.*); body short; snout long .... HYDRUS, p. 397.
    - *c''.* Maxillary much longer than transpalatine; 7 to 18 solid teeth on each maxillary HYDROPHIS, p. 398.

b. Mental shield narrow, elongate, partly concealed in a deep groove in the lower jaw; maxillary a little longer than transpalatine, with 4 solid teeth .... ENHYDRINA, p. 405

B. Poison-fangs followed by 4 to 10 solid maxillary teeth, which are grooved anteriorly .... DISTIRA, p. 407.

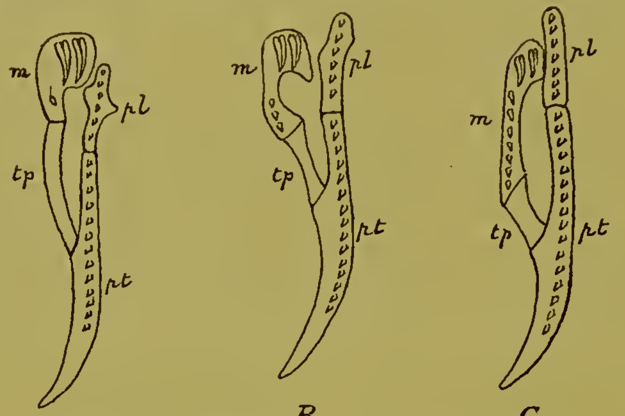

Fig. 116.—Views of right maxillo-palatal arch.
A. *Platurus.* B. *Enhydris.* C. *Hydrus.*
m. Maxillary. *pl.* Palatine. *pt.* Pterygoid. *tp.* Transpalatine.

Genus PLATURUS,

Daudin, Hist. Rept. vii, p. 223, 1803.

Maxillary very short, with a pair of large grooved fangs followed by a single very small solid tooth. Head-shields normal; nasals

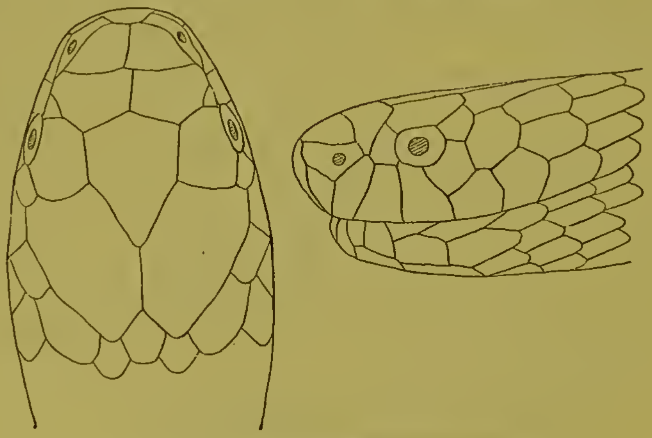

Fig. 117.—Head of *Platurus laticaudatus.*

lateral. Scales smooth and imbricate. Ventrals and subcaudals large.

Distribution. Eastern parts of the Indian Ocean and West Pacific.

This genus approaches the *Elapinæ* (*Bungarus* and *Callophis*) in the shape of the skull, the scaling of the head and body, and

the general appearance. In fact, nothing but the shape of the tail would prevent *Platurus* being placed close to *Bungarus* and *Callophis*. Species of *Platurus* are not so absolutely aquatic as the other Hydrophids, and there are several records of specimens found at some distance from water. In a recent note on Snakes from Sumatra, Dr. van Lidth de Jeude mentions that a specimen of *P. colubrinus* was captured by Dr. Hagen in the forests of Serdang at a distance from the sea of nearly a day's journey.

Synopsis of the Species.

A. No ventral keel.
  a. No azygous shield on snout; scales in 19 rows . . . . *P. laticaudatus*, p. 395.
  b. An azygous shield between præfrontals; scales in 21–25 rows . . . . *P. colubrinus*, p. 395.
B. A keel along posterior half of belly . . . . *P. schistorhynchus.*

P. schistorhynchus, Gthr. (*H. colubrinus*, Schleg. Faun. Japon., Rept. pl. x), is known from the Chinese Sea and the Western Pacific, but has not been recorded from the coasts of India or Burma.

487. Platurus laticaudatus.

Coluber laticaudatus, *Linn. Mus. Ad. Frid.* pl. xvi, fig. 1; *id. Syst. Nat.* i, p. 383.
Laticaudata scutata, *Laur. Syn. Rept.* p. 109.
Platurus fasciatus, part., *Daud. Rept.* vii, p. 226; *Dum. & Bibr. Erp. Gén.* vii, p. 1321.
Platurus fischeri, *Jan, Rev. et Mag. Zool.* 1859, p. 149; *Günth. Rept. B. I.* p. 356, pl. xxv, fig. A; *Anders. P. Z. S.* 1871, p. 189; *Fayrer, Thanatoph.* pl. xix; *Jan, Icon. Ophid.* 40, pl. i, fig. 2.
Platurus affinis, *Anders. l. c.* p. 190.
Platurus laticaudatus, *Peters, MB. Ak. Berl.* 1877, p. 417.

No azygous shields on the snout; one præ- and two postoculars; 7 or 8 upper labials, third and fourth entering the eye; temporals 1+2. Scales in 19 rows. Ventrals not keeled, 220–240; subcaudals 25–45. Olive above, yellowish beneath, with black annuli which are as broad as the interspaces between them or broader.

Total length 3 feet 3 inches.

Hab. From the Bay of Bengal and the Chinese Sea to Polynesia.

488. Platurus colubrinus.

Hydrus colubrinus, *Schneid. Hist. Amph.* i, p. 238.
Platurus fasciatus, part., *Daud. Rept.* vii, p. 226, pl. lxxxv, fig. 1; *Dum. & Bibr. Erp. Gén.* vii, p. 1321.
Laticauda scutata, *Cantor, J. A. S. B.* xvi, 1847, p. 1046.
Platurus fasciatus, *Jan, Rev. et Mag. Zool.* 1859, p. 149, *and Icon. Ophid.* 40, pl. i, fig. 1.
Platurus scutatus, *Günth. Rept. B. I.* p. 356.
Platurus colubrinus, *Peters, MB. Ak. Berl.* 1877, p. 418.

An azygous shield between the præfrontals, and sometimes one or two between the internasals; one præ- and two postoculars; 6 or 7 upper labials, third and fourth entering the eye; temporals 1+2 or 2+2. Scales in 21–25 rows. Ventrals not keeled, 195–240; subcaudals 30–45. Olive above, yellowish below, with black annuli which are as wide as the interspaces between them or narrower.

Total length 5 feet.

Hab. Same as the preceding. According to observations recently made in Japan, this snake does not bite.

Genus ENHYDRIS,

Merrem, Tent. Syst. Amph. p. 140, 1820.

Maxillary short, about as long as the transpalatine, with a pair of large grooved fangs followed, after a considerable interval, by two to four small solid teeth. Nostrils superior; nasal shields in contact with each other; head-shields large. Body short and stout. All the scales hexagonal or squarish and juxtaposed. Ventrals very feebly developed, if at all distinct.

Only two species:—

Parietals broken up into small shields........ *E. curtus*, p. 396.
Parietals large .... *E. hardwickii*, p. 397.

489. Enhydris curtus.

Hydrus curtus, *Shaw, Zool.* iii, p. 562.
Enhydris curtus, *Merr. Tent.* p. 140.
Hydrophis propinquus, *Jan, Rev. et Mag. Zool.* 1859, p. 151, *and Icon. Ophid.* 41, pl. i, fig. 2.
Hydrophis curta, *Günth. Rept. B. I.* p. 379; *Fayrer, Thanatoph.* pl. xxiv; *Stoliczka, P. A. S. B.* 1872, p. 91; *Murray, Zool. Sind,* p. 395.

Parietals broken up into small shields; one præ- and one or two postoculars; two or three superposed anterior temporals; 7 upper labials, fourth, or third and fourth, entering the eye; chin-shields very small, and separated by scales, or quite indistinct. 30 to 38 scales round the anterior part of the body, 33 to 42 round the middle, with a very feebly-developed tubercle or short keel; the scales on the lower surface, in the male, with a very strong spinose tubercle. Ventrals distinct in the anterior half of the body, with two spinose tubercles in the male, 150–200 *. Above with dark transverse bands, broadest in the middle; these bands are usually very dark, nearly black, but in some old specimens rather indistinct; end of tail black.

Total length $2\frac{1}{2}$ feet.

Hab. Coasts of India and Ceylon.

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* As remarked by Stoliczka in this species, and by Boettger in the following, he males have fewer scales than the females.

490. Enhydris hardwickii.

Lapemis hardwickii, *Gray, Ill. Ind. Zool.* ii, pl. lxxxvii, fig. 2.
Hydrophis pelamidoides, *Schleg. Phys. Serp.* ii, p. 512, pl. xviii, figs. 16 & 17; *Dum. & Bibr. Erp. Gén.* vii, p. 1345; *Jan, Icon. Ophid.* 41, pl. iii, fig. 1.
Lapemis loreatus, *Gray, A. M. N. H.* xi, 1843, p. 46.
Hydrophis (Pelamis) pelamidoides, *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 64, pl. iii.
Hydrophis problematicus, *Jan, Rev. et Mag. Zool.* 1859, p. 150.
Hydrophis hardwickii, *Günth. Rept. B. I.* p. 380, pl. xxv, fig. W.
Hydrophis loreata, *Günth op. cit.* p. 380; *Boettg. Zool. Anz.* 1888, p. 396.
Hydrophis fayreriana, *Anders. J. A. S. B.* xl, 1871, pt. 2, p. 19.
Hydrophis abbreviatus *and* H. brevis, *Jan, Icon. Ophid.* 40, pl. iv, fig. 2, & pl. v, fig. 2.

Parietals large; one præ- and one to three postoculars; a loreal sometimes present; two or three superposed anterior temporals; seven upper labials, fourth, or third and fourth, entering the eye; chin-shields very small and separated by scales, or quite indistinct. 25 to 33 scales round the anterior part of the body, 34 to 37 round the middle of the body, with tubercles as in the preceding species. Ventrals usually very indistinct, 135–200. Coloration as in the preceding, but the dark bands often forming complete rings round the body.

Total length $2\frac{1}{2}$ feet.

Hab. From the Bay of Bengal to the Chinese Sea and the coast of New Guinea.

Genus HYDRUS,

Schneider, Hist. Amph. i, p. 233 (part.), 1799.

Maxillary much longer than transpalatine; poison-fangs short, followed, after a short interval, by seven or eight solid teeth. Snout long; nostrils superior; nasal shields in contact with each other; head-shields large. Body short. All the scales hexagonal or squarish, and juxtaposed. No distinct ventrals.

Only one species.

491. Hydrus platurus.

Russell, Ind. Serp. i, pl. xli.
Anguis platura, *Linn. Syst. Nat.* i, p. 391.
Hydrus bicolor, *Schneid. Hist. Amph.* i, p. 242; *Cantor, J. A. S. B.* xvi, 1847, p. 1056.
Pelamis bicolor, *Daud. Rept.* vii, p. 366, pl. lxxxix; *Dum. & Bibr. Erp. Gén.* vii, p. 1335; *Günth. Rept. B. I.* p. 382; *Fayrer, Thanatoph.* pl. xvii; *Murray, Zool. Sind*, p. 397.
Pelamis ornata, *Gray, Cat. Sn.* p. 43.
Hydrophis bicolor, *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 61; *Jan, Icon. Ophid.* 40, pls. ii & iii.
Pelamis platurus, *Stoliczka, P. A. S. B.* 1872, p. 92.

Frontal large, at least as long as the snout or the parietals; one præ- and two or three postoculars; temporals small and numerous; 7 or 8 upper labials, fourth, or fourth and fifth, entering the eye; chin-shields small or indistinct. 45 to 57 scales round the body, smooth in the females and young, with one, two, or three small tubercles in the male. Yellowish, with black cross bands or symmetrical spots, or uniform black above and yellow beneath, with or without black spots; tail yellowish, with black spots or cross bands.

Total length 3 feet.

Hab. This is the most widely distributed Sea-Snake, being found throughout the Indian Ocean and the Tropical or Subtropical Pacific; the extreme points from which it is recorded being the Persian Gulf, the Cape of Good Hope, the Japanese Sea, Posiette Bay, New Zealand, the west coast of Central America, and Guayaquil.

Genus **HYDROPHIS**,

Daudin, Hist. Rept. vii, p. 372, 1803.

Maxillary much longer than transpalatine; poison-fangs large, followed by a series of seven to eighteen solid teeth. Head small; nostrils superior; nasal shields in contact with each other; head-

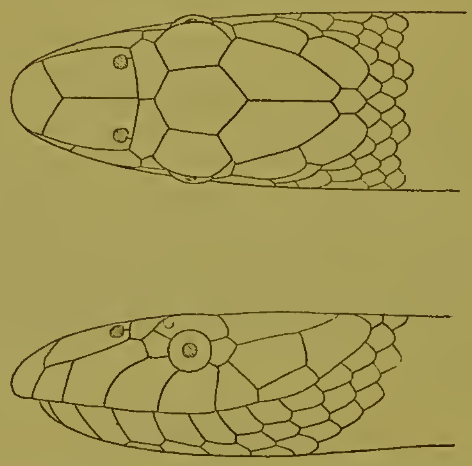

Fig. 118.—Head of *Hydrophis gracilis*.

shields large. Body long, often very slender anteriorly. Scales on the anterior part of the body imbricate. Ventrals more or less distinct, small.

About 20 species are known.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Two superposed anterior temporals.
  a. 32 scales round neck, 47 round middle of body; frontal as long as its distance from rostral .... *H. schistosus*, p. 399.
  b. 35–38 scales round neck, 48–50 round middle of body; frontal shorter than its distance from rostral .... *H. cærulescens*, p. 400.
  c. 27–29 scales round neck, 39 round middle of body; scales all imbricate .... *H. nigrocinctus*, p. 400.
  d. 25–27 scales round neck, 35 round middle of body; scales on hinder half of body juxtaposed........ *H. mamillaris*, p. 401.

B. A single anterior temporal.
  a. All the scales imbricate.
    a′. 29 to 33 scales round middle of body.
      a″. 28–29 scales round neck .... *H. spiralis*, p. 401.
      b″. 21 scales round neck; posterior chin-shields separated by scales........ *H. latifasciatus*, p. 401.
      c″. 19–23 scales round neck; posterior chin-shields in contact with each other........ *H. coronatus*, p. 402.
    b′. 40 to 50 scales round middle of body.
      a″. 33–35 scales round neck; frontal shorter than its distance from rostral. *H. torquatus*, p. 402.
      b″. 34–40 scales round neck; frontal as long as its distance from rostral.... *H. obscurus*, p. 403.
      c″. 25–31 scales round neck; frontal as long as its distance from rostral .. *H. fasciatus*, p. 404.
  b. Scales on posterior half of body hexagonal and juxtaposed.
    a′. 19–21 scales round neck, 29–33 round middle of body; rostral as deep as broad........ *H. gracilis*, p. 404.
    b′. 23–25 scales round neck, 41 round middle of body; rostral deeper than broad .... *H. cantoris*, p. 405.

492. Hydrophis schistosus.

Russell, Ind. Serp. ii, pl. x.
Hydrophis schistosus, *Daud. Rept.* vii, p. 386.
Hydrophis nigra, *Anders. P. Z. S.* 1872, p. 399; *Fayrer, Thanatoph.* pl. xxv.

Head moderate; body moderately elongate. Rostral broader than deep; nasals about as long as the frontal, more than twice as long as the suture between the præfrontals; frontal slightly longer than broad, shorter than the parietals; one præ- and one post-ocular; 7 upper labials, second largest, third and fourth entering the eye; two superposed anterior temporals; two pairs of subequal chin-shields, posterior separated by one scale; 32 scales round the neck, 47 round the middle of the body; scales elongate, rhom-

boidal, smooth or feebly keeled, feebly imbricate anteriorly, juxtaposed posteriorly. Ventrals distinct anteriorly, 235 (–306). Uniform blackish.

Total length 3 feet.

Hab. Bengal and Cuttack coasts.

493. Hydrophis cærulescens.

Hydrus cærulescens, *Shaw, Zool.* iii, p. 561.
Enhydris cærulescens, *Merr. Tent.* p. 140.
Hydrophis cærulescens, *Gray, Zool. Misc.* p. 62; *Günth. Rept. B. I.* p. 365, pl. xxv, fig. C.

Head very small; anterior part of body very slender, its diameter about one third the depth of the posterior part. Rostral broader than deep; frontal longer than broad, shorter than its distance from the rostral, much shorter than the parietals; one præ- and one postocular; two superposed anterior temporals; 7 upper labials, third and fourth entering the eye; chin-shields very small, posterior pair separated by scales. 35 to 38 scales round the neck, 48 to 50 round the middle of the body; scales rhomboidal, imbricate, with a strong short keel. Ventrals distinct throughout, 294–309. Grey above, with black cross bands, broader on the back, which form complete rings, or are interrupted on the belly; head uniform black.

Total length 2 feet.

Hab. Bombay coast, Bay of Bengal, Straits of Malacca.

494. Hydrophis nigrocinctus.

Russell, Ind. Serp. ii, pl. vi.
Hydrophis nigrocinctus, *Daud. Rept.* vii, p. 380; *Dum. & Bibr. Erp. Gén.* vii, p. 1350 (part.); *Günth. Rept. B. I.* p. 368, pl. xxv, fig. L; *Fayrer, Thanatoph.* pl. xxv.

Head small; anterior part of body slender, its diameter about two fifths the depth of the posterior part. Rostral broader than deep; nasals shorter than the frontal, about twice as long as the suture between the præfrontals; frontal longer than broad, as long as its distance from the end of the snout, shorter than the parietals; one præ- and one or two postoculars; a small loreal sometimes present; 7 upper labials, third and fourth entering the eye, second and fourth largest; two superposed anterior temporals: two pairs of subequal chin-shields, posterior separated by scales. 27 or 29 scales round the neck, 39 round the middle of the body; scales imbricate, rhombic, keeled. Ventrals distinct, but feebly enlarged, 317–331. Pale olive above, yellowish beneath, with black annuli, which are broadest on the back.

Total length 40 inches.

Hab. Bay of Bengal and Straits of Malacca.

495. Hydrophis mamillaris.

Russell, Ind. Serp. i, pl. xliv.
Anguis mamillaris, *Daud. Rept.* vii, p. 340.
Hydrophis fasciata (*non Schn.*), *Günth. Rept. B. I.* p. 374, pl. xxv, fig. Q.

Head very small; anterior part of body very slender, its diameter about one third the depth of the posterior part. Rostral broader than deep; frontal longer than broad, as long as its distance from the end of the snout, a little shorter than the parietals; one præ- and two postoculars; 7 upper labials, third and fourth entering the eye; two superposed anterior temporals; two pairs of chin-shields, in contact with each other. 25 to 27 scales round the neck, 35 round the middle of the body; scales rhomboidal and imbricate on the neck, hexagonal and juxtaposed on the body, with a tubercle or short keel. Ventrals distinct throughout, 287–316. Black, with yellowish annuli, which are interrupted on the belly.

Total length 26 inches.

Hab. I have examined two specimens: one from the Vizagapatam coast, the other from Bombay.

496. Hydrophis spiralis.

Hydrus spiralis, *Shaw, Zool.* iii, p. 564, pl. cxxv.
Hydrophis melanurus, *Wagl. Icon. Amph.* pl. iii.
Hydrophis spiralis, *Gray, Cat. Sn.* p. 54; *Günth. Rept. B. I.* p. 366, pl. xxv, fig. D; *Anders. P. Z. S.* 1872, p. 397; *Murray, Zool. Sind*, p. 390.
Hydrophis nigrocinctus, *Jan, Icon. Ophid.* 41, pl. ii, fig. 2.

Head rather small; body moderately elongate. Rostral broader than deep; frontal longer than broad, as long as its distance from the rostral, a little shorter than the parietals; one præ- and one postocular; a single anterior temporal, descending to the labial border; 6 or 7 upper labials, second largest, third and fourth entering the eye; two pairs of subequal chin-shields, in contact. 28 or 29 scales round the neck, 33 to 35 round the middle of the body; scales imbricate, smooth in the young, with a central tubercle in the adult. Ventrals distinct, but feebly enlarged, 310–320. Olive above, yellowish beneath, with black rings connected by a black ventral band in the young; a more or less distinct series of round black dorsal spots between the rings; head black above, with a horseshoe-shaped yellow mark, the convexity of which rests on the præfrontal shields; end of tail black.

Total length 6 feet (Günther). I have only seen young specimens.

Hab. Indian Ocean; Anderson received specimens from the Cuttack coast, and Murray records the species from the Sind and Cutch coasts.

497. Hydrophis latifasciatus.

Hydrophis latifasciata, *Günth. Rept. B. I.* p. 372, pl. xxv, fig. T; *Blanf. J. A. S. B.* xlviii, 1879, pt. 2, p. 132.

Head small; anterior part of body slender, its diameter about one third the depth of the posterior part. Rostral broader than deep; nasals slightly longer than the frontal, more than twice as long as the suture between the præfrontals; frontal small, longer than broad, much shorter than the parietals, or than its distance from the rostral; one præ- and one postocular; præfrontal in contact with the second labial; 6 upper labials, second largest, third and fourth entering the eye; a single, large anterior temporal; two pairs of chin-shields, posterior separated by scales. 21 scales round the neck, 33 round the middle of the body; scales imbricate and keeled. Ventrals distinct, but feebly enlarged, 322. Dark olive, sides with vertical yellowish bars; these bars continuous across the neck.

Total length 29 inches.

Hab. Mergui; a single specimen. Blanford records a second from Pegu.

498. **Hydrophis coronatus.**

Hydrophis coronata, *Günth. Rept. B. I.* p. 372, pl. xxv, fig. M; *Anders. P. Z. S.* 1871, p. 192; *Fayrer, Thanatoph.* pl. xxvi.

Head very small, narrow; body long, extremely slender anteriorly*. Rostral broader than deep; frontal small, longer than broad, hardly as long as its distance from the rostral; one præ- and one postocular; a single anterior temporal, descending to the labial border; 6 upper labials, third and fourth entering the eye; two pairs of chin-shields, in contact with each other. 19 to 23 scales round the neck, 29 to 33 round the middle of the body; all the scales rhomboidal and imbricate, dorsals with a keel, laterals with a central tubercle. Ventrals hardly distinct, 321–337. Head and neck blackish or dark green, the former with a horseshoe-shaped yellow mark above, the convexity on the snout, the latter with regular yellow cross bands or rings; body likewise with yellow cross bands or rings, which may be interrupted on the back.

Total length 3 feet.

Hab. Coast of Bengal. I have examined two specimens (the types), male and female; a fine female is figured by Fayrer.

499. **Hydrophis torquatus.**

Hydrophis nigrocincta, part., *Schleg. Phys. Serp.* ii, p. 506, pl. xviii, figs. 11 & 12.
Hydrus nigrocinctus, *Cantor, J. A. S. B.* xvi, 1847, p. 1049.
Hydrophis torquata, *Günth. Rept. B. I.* p. 369, pl. xxv, fig. H.

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* As in *H. obscurus* and other species, the neck is proportionally much more slender in the female than in the male, as may be seen by the following measurements of the two type specimens:—

♂. Total length 2 feet 1 in.; diameter of neck 0·25 inch; greatest depth of body 0·8 inch.

♀. Total length 3 feet; diameter of neck 0·25 inch; greatest depth of body 1·3 inches.

Head small; anterior part of body slender, its diameter about one third the depth of the posterior part. Rostral broader than deep; nasals longer than the frontal, at least twice as long as the suture between the præfrontals; frontal small, as long as broad or a little longer than broad, shorter than its distance from the rostral, much shorter than the parietals; one præ- and one postocular; præfrontal in contact with the second labial; 6 or 7 upper labials, second largest, third and fourth entering the eye; a single, large anterior temporal; two pairs of subequal chin-shields, in contact with each other. 33 or 35 scales round the neck, 43 or 45 round the middle of the body; scales imbricate and keeled. Ventrals distinct, but feebly enlarged, 283–285. Pale greyish olive, with blackish cross bands tapering on the sides.

Total length 23 inches.

Hab. Bay of Bengal and Straits of Malacca.

500. Hydrophis obscurus.

Russell, Ind. Serp. ii, pls. vii (♀) & viii (♂).
Hydrophis obscurus, *Daud. Rept.* vii, p. 375.
Hydrophis cloris, *Daud. t. e.* p. 377, pl. xc.
Hydrophis stricticollis, *Günth. Rept. B. I.* p. 376, pl. xxv, fig. R; *Anders. P. Z. S.* 1872, p. 397; *Fayrer, Thanatoph.* pl. xxviii; *Günth. A. M. N. H.* (4) ix, 1872, p. 33; *Peters, MB. Ak. Berl.* 1872, p. 858.

Head very small; body very long, extremely slender anteriorly. Rostral broader than deep; frontal longer than broad, as long as its distance from the rostral or the end of the snout; one præ- and one postocular; a single anterior temporal; 7 or 8 upper labials, second largest, third and fourth entering the eye; two pairs of chin-shields, posterior smallest and usually separated by scales. 34 to 40 scales round the neck, 45 to 50 round the middle of the body; scales rhomboidal, imbricate, feebly keeled in the female, strongly in the male, the keels often broken up into tubercles. Ventrals very feebly enlarged, longer than broad under the neck, bicarinate in the male, 332–438. Olive or dark green above, with yellowish cross bars, which form complete rings round the slender part of the body; on the other two thirds of the body these bands are interrupted on the back; a yellow spot on the snout and a yellow streak on each side of the upper surface of the head; young with blackish rings.

Total length 3 feet 11 inches.

Hab. Russell's female specimen was obtained in the Sunderbans; an almost identical specimen, presented to the British Museum by Sir J. Fayrer, is from the same district. Peters records the species from Madras, and Theobald obtained specimens on the coast of Pegu.

501. Hydrophis fasciatus.

Hydrus fasciatus, *Schneid. Hist. Amph.* i, p. 240.
Hydrophis gracilis, part., *Schleg. Phys. Serp.* ii, p. 507; *Dum. & Bibr.* vii, p. 1352; *Jan, Icon. Ophid.* 41, pl. iv, fig. 2.
Hydrophis chloris (*non Daud.*), *Günth. Rept. B. I.* p. 370; *Anders. P. Z. S.* 1871, p. 191, and 1872, p. 396; *Fayrer, Thanatoph.* pl. xxvii; *Murray, Zool. Sind,* p. 392.
Aturia lindsayi, *Gray, Zool. Misc.* p. 61.
Hydrophis lindsayi, *Gray, Cat. Sn.* p. 50; *Günth. Rept. B. I.* p. 371; *Anders. P. Z. S.* 1871, p. 191, and 1872, p. 396; *Murray, Zool. Sind,* p. 392.
Hydrophis atriceps, *Günth. Rept. B. I.* p. 371, pl. xxv, fig. I.

Head very small; body long, extremely slender anteriorly*. Rostral nearly as deep as broad; frontal longer than broad, as long as its distance from the rostral; one præ- and one or two postoculars; a single anterior temporal, followed by a second equally large; 6 or 7 upper labials, third and fourth entering the eye; two pairs of small chin-shields, in contact with each other. 25 to 31 scales round the neck, 40 to 48 round the middle of the body; all the scales rhomboidal and imbricate, on the neck smooth, on the body with a small tubercle or short keel. Ventrals feebly enlarged, 345-500. Head and neck black, the latter with yellowish cross bands; body pale, with black cross bands or annuli, which are broadest on the back.

Total length 3 feet 3 inches.

Hab. From the coast of India to Siam and the Indian Archipelago.

502. Hydrophis gracilis.

Russell, Ind. Serp. ii, pl. xiii (male).
Hydrus gracilis, *Shaw, Zool.* iii, p. 560.
Thalassophis microcephala, *Schmidt, Abh. Naturw. Hamb.* ii, 2e Abth. 1852, p. 78, pl. ii.
Hydrophis gracilis, part., *Dum. & Bibr. Erp. Gén.* vii, p. 1352.
Hydrophis microcephala, *Dum. & Bibr. t. c.* p. 1356; *Jan, Icon. Ophid.* 41, pl. v, fig. 2.
Hydrophis gracilis, *Günth. Rept. B. I.* p. 373; *Murray, Zool. Sind,* p. 395.
Hydrophis guentheri (*non Theob.*), *Murray, l. c.* p. 396, pl.—.

Head very small, narrow; body long, extremely slender anteriorly. Snout strongly projecting beyond the lower jaw; rostral as deep as broad; frontal very small, longer than broad, hardly as long as its distance from the rostral; one præ- and one postocular; a single anterior temporal, followed by a second equally large shield; 6 upper labials, third and fourth entering the eye; two pairs of small chin-shields in contact with each other. 19 to 21

* See footnote under *H. coronatus* (p. 402). The specimens named *H. chloris* by Dr. Günther are females, those named *H. lindsayi* and *atriceps* are mostly (six specimens out of seven) males.

scales round the neck, 29 to 33 round the middle of the body; scales smooth, rhomboidal and imbricate anteriorly, elsewhere hexagonal, juxtaposed, each with two or more tubercles, which are feeble in the female and very strong in the male. Ventrals distinct only anteriorly, very feebly enlarged, 225–294. Bluish black or greyish olive above in the adult, with more or less distinct lighter cross bands anteriorly. Young with the head and neck black, the latter region with light transverse bands; body with rhombic black cross bands continued on to the belly, or sub-interrupted on the sides, or black with a series of elliptical vertical whitish spots on each side.

Total length 3 feet.

Hab. From the Persian Gulf and the Makrán coast, along the coasts of India and Burma to the Indian Archipelago.

503. Hydrophis cantoris.

Hydrus gracilis, part., *Cantor, J. A. S. B.* xvi, 1847, p. 1051.
Hydrophis cantoris, *Günth. Rept. B. I.* p. 374, pl. xxv, fig. U; *Anders. P. Z. S.* 1871, p. 192; *Boettger, Ber. Senck. Ges.* 1889, p. 304.

Head very small, narrow; body long, extremely slender anteriorly. Rostral considerably deeper than broad; frontal small, longer than broad, hardly as long as its distance from the rostral; one præ- and one postocular; a single anterior temporal, followed by a second equally large shield; 6 upper labials, third and fourth entering the eye; two pairs of small chin-shields, in contact with each other. 23 to 25 scales round the neck, 41 round the middle of the body; scales smooth, rhomboidal and imbricate anteriorly, elsewhere hexagonal, juxtaposed, each with two or three tubercles one before the other. Ventrals hardly enlarged, 412–456. Body dark olive or blackish anteriorly, with yellowish cross bands above; posterior part of body olive above, yellowish on the sides; tail with olive vertical bars; a blackish streak along the belly.

Total length 4 feet.

Hab. The type specimen is from Pinang. Others have been obtained from the mouth of the Hooghly, Ganjam, and Madras.

Genus ENHYDRINA,

Gray, Cat. Snakes, p. 47, 1849.

Maxillary a little longer than transpalatine, with a pair of large grooved fangs, followed by four solid teeth. Nostrils superior; nasals in contact with each other; head-shields large; mental narrow, partly concealed in a deep symphysial groove. Body moderately elongate; scales imbricate. Ventrals distinct, very small.

A single species.

504. Enhydrina valakadien.

Russell, Ind. Serp. ii, pl. xi.
Hydrus valakadyn, *Boie, Isis,* 1827, p. 554.
Polyodontes annulatus, *Lesson, in Bélang. Voy. Ind. Or., Rept.* p. 325, pl. iv.
Hydrophis schistosa (*non Daud.*), *Schleg. Phys. Serp.* ii, p. 500, pl. xviii, figs. 1–3; *Dum. & Bibr. Erp. Gén.* vii, p. 1344; *Jan, Icon. Ophid.* 41, pl. ii, fig. 1.
Hydrophis bengalensis *and* H. subfasciata, *Gray, Zool. Misc.* p. 62.
Hydrus schistosus, *Cantor, J. A. S. B.* xvi, 1847, p. 1053.
Enhydrina bengalensis, *Gray, Cat. Sn.* p. 48; *Günth. Rept. B. I.* p. 381; *Fayrer, Thanatoph.* pl. xviii; *Murray, Zool. Sind,* p. 396.
Enhydrina valakadyen, *Gray, Cat. Sn.* p. 48; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 213, *and P. A. S. B.* 1872, p. 91.
Enhydrina schistosa, *Stoliczka, J. A. S. B.* xxxix, *l. c.*; *Anders P. Z. S.* 1871, p. 193.
Hydrophis fasciatus, *Jan, Icon. Ophid.* 41, pl. iii, fig. 2.

Fig. 119.—*Enhydrina valakadien.*

Rostral deeper than broad; frontal small, longer than broad, shorter than its distance from the end of the snout or than the parietals; one præ- and one or two postoculars; 7 or 8 upper labials, fourth or third and fourth entering the eye; usually a single anterior temporal; chin-shields small or indistinct. 40 to 60 scales round the neck, 50 to 70 round the middle of the body; scales feebly imbricate, with a small tubercle or short keel, which is stronger in the males. Ventrals very slightly enlarged,

284–314. Young olive or grey above, with black transverse bands, broadest in the middle and tapering to a point on the sides; in the adult these bands are usually less distinct, some specimens being uniform dark grey above; sides and lower parts whitish.

Total length 4 feet.

Hab. From the Persian Gulf, along the coasts of India and Burma to the Malay Archipelago and New Guinea.

Genus DISTIRA,

Lacépède, Ann. du Mus. iv, 1804, p. 210 *.

Maxillary longer than transpalatine; poison-fangs large, followed by four to ten solid teeth which are grooved anteriorly. Head moderate or rather small; nostrils superior; nasal shields in contact with each other; head-shields large. Body more or less elongate; scales on the anterior part of the body imbricate. Ventrals usually more or less distinct, small.

We know about 14 species.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. All the scales strongly imbricate; the ventrals usually in pairs and pointed, except quite anteriorly; no chin-shields; 39-47 scales round neck, 48-53 round middle of body . . . . *D. stokesii*, p. 408.

B. Scales on body feebly imbricate, or juxtaposed.

- *a.* Frontal shield longer than broad.
  - *a'.* Two pairs of chin-shields, in contact on middle line, or posterior separated by a single scale.
    - *a''.* A single large anterior temporal; scales on body imbricate.
      - *α.* 15–17 scales round neck, 19–21 round middle of body . . . . *D. jerdonii*, p. 408.
      - *β.* 27–31 scales round neck, 32–35 round middle of body . . . . *D. robusta*, p. 409.
      - *γ.* 38 scales round neck . . . . *D. tuberculata*, p. 409.
    - *b''.* Two or three superposed anterior temporals.
      - *α.* Scales on body imbricate.
        - *α'.* 27–33 scales round neck, 39–43 round middle of body . . . . *D. cyanocincta*, p. 410.
        - *β'.* 26 or 27 scales round neck, 48 or 49 round middle of body . . . . . . *D. bituberculata*, p. 411.
      - *β.* Scales on body juxtaposed. 30–33 scales round neck, 43–47 round middle of body . . . . *D. lapemidoides*, p. 412.

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* Type: *D. major*, Shaw (=*Hydrus major*, part., Shaw, *Disteira doliata*, Lacép., *Hydrophis mentalis*, Gray, *Disteira dumerilii*, Jan).

b'. Second pair of chin-shields, if distinct, separated by several scales; 35–42 scales round neck, 40–50 round middle of body .... *D. ornata*, p. 411.
b. Frontal shield as broad as long; anterior ventrals comparatively very broad .... *D. viperina*, p. 413.

505. Distira stokesii.

Hydrus major, part., *Shaw, Zool.* iii, p. 558; *Gray, Cat. Sn.* p. 58.
Hydrus stokesii, *Gray, in Stokes, Australia*, i, p. 502, pl. iii.
Hydrophis schizopholis, *Schmidt, Abh. Naturw. Hamb.* i, 1846, p. 166, pl. xv; *Dum. & Bibr. Erp. Gén.* vii, p. 1357.
Hydrus annulatus, *Gray, Cat. Sn.* p. 59.
Astrotia schizopholis, *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 38; *Jan, Icon. Ophid.* 39, pl. iii.
Hydrophis stokesii, *Günth. Rept. B. I.* p. 363.
? Hydrophis guentheri, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 69.
? Hydrophis granosa, *Anders. P. Z. S.* 1871, p. 190.
Hydrophis guttata, *Murray, J. Bomb. N. H. Soc.* ii, 1887, p. 33.

Head moderate; body stout. Rostral as deep as broad; nasals shorter than the frontal, more than twice as long as the suture between the præfrontals; frontal longer than broad, as long as or slightly longer than its distance from the rostral; one præ- and two postoculars; 9 or 10 upper labials, fourth, fifth, and sixth entering the eye, if not divided to form a series of suboculars; two or three superposed anterior temporals; no chin-shields. 39 to 47 scales round the neck, 48 to 53 round the middle of the body; scales much imbricate, pointed, keeled, the keel frequently broken up into two tubercles. Ventrals usually distinct only quite anteriorly, further back in pairs and not larger than the adjoining scales; 240–267. Yellowish or pale brownish, with broad black dorsal cross bands, or with complete black annuli.

Total length 5 feet.

Hab. From the Makrán coast and the Chinese Sea to the North coast of Australia.

506. Distira jerdonii.

Russell, Ind. Serp. ii, pl. xii.
Hydrus nigrocinctus, var., *Cantor, J. A. S. B.* xvi, 1847, p. 1050, pl. xl, fig. 8.
Kerilia jerdonii, *Gray, Cat. Sn.* p. 57.
Hydrus cantori, *Jerdon, J. A. S. B.* xxii, 1854, p. 526.
Hydrophis jerdonii, *Günth. Rept. B. I.* p. 362, pl. xxv, fig. B; *Anders. P. Z. S.* 1871, p. 190; *Fayrer, Thanatoph.* pl. xx.

Head short, snout declivous and rather pointed; body moderately elongate. Rostral as deep as broad; nasals shorter than the frontal, more than twice as long as the suture between the præfrontals; frontal longer than broad, nearly as long as its distance from the end of the snout, shorter than the parietals; one præ- and one postocular; 5 upper labials, third and fourth entering the eye; a single large anterior temporal, descending to the labial

margin. 15 or 17 scales round the neck, 19 or 21 round the middle of the body; scales broader than long, slightly imbricate, strongly keeled. Ventrals distinct, but feebly enlarged, more or less distinctly bituberculate, 224–238. Olive above, yellowish beneath, with black cross bands which form complete rings in young and half-grown specimens; a black spot may be present between each pair of annuli.

Total length 35 inches.

Hab. Bay of Bengal and Straits of Malacca.

507. Distira robusta.

Hydrophis nigrocincta, part., *Schleg. Phys. Serp.* ii, p. 505, pl. xviii, figs. 8-10.
Hydrophis nigrocincta (*non Daud.*), *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 46, pl. i.
Hydrophis robusta, *Günth. Rept. B. I.* p. 364; *Fayrer, Thanatoph.* pl. xxi; *Murray, Zool. Sind,* p. 394.
Hydrophis rappii, *Jan, Icon. Ophid.* 41, pl. iv, fig. 1.
Hydrophis temporalis, *Blanf. P. Z. S.* 1881, p. 680, fig.
Hydrophis bishopii, *Murray, Zool. Sind,* p. 391, pl. —.

Head moderate; body moderately elongate. Rostral broader than deep; nasals shorter than the frontal, about twice as long as the suture between the præfrontals; frontal much longer than broad, as long as its distance from the end of the snout, shorter than the parietals; one præ- and one or two postoculars; 7 upper labials, second largest, third and fourth, or third, fourth, and fifth, entering the eye; a single large anterior temporal, descending to the labial margin; two pairs of subequal chin-shields, in contact on the middle line. 27 to 31 scales round the neck, 32 to 35 round the middle of the body; scales rhomboidal and subimbricate, smooth or each with a more or less distinct central tubercle or short obtuse keel. Ventrals distinct throughout, smooth or bitubercular, 310–372. Greenish yellow above, dorsal scales with black margins, with black cross bands or annuli, which are narrower than the interspaces between them; sides and lower parts yellowish; end of tail black.

Total length 6 feet.

Hab. Persian Gulf and coasts of India, Burma, and the Malay Archipelago.

508. Distira tuberculata.

Hydrophis tuberculata, *Anders. J. A. S. B.* xl, 1871, pt. 2, p. 18; *Murray, Zool. Sind,* p. 393.

Head moderate; neck not very slender. Rostral broader than deep; head-shields studded with minute granules; fourth and fifth labials below the eye; one præ- and two postoculars; anterior temporal large and almost entering the labial margin; two pairs of large square chin-shields in contact with each other. 38 rows of slightly imbricate scales round the neck, each with two

prominent tubercles, one before the other. Ventrals 321, small, irregular; each ventral with several minute tubercles on either side. Body encircled by black bands, broadest and blackest on the back; ground-colour olive-yellow above, bright gamboge-yellow below.

Total length 4 feet.

Hab. Tidal streams, Calcutta. Specimens from the Persian Gulf and Karáchi are referred to this species by Murray. This snake is unknown to me, and the above is an abstract of Anderson's description.

509. **Distira cyanocincta.**

Russell, Ind. Serp. ii, pl. ix.

Hydrophis cyanocinctus, *Daud. Rept.* vii, p. 383; *Günth. Rept. B. I.* p. 367; *Fayrer, Thanatoph.* pl. xxiii; *Peters, MB. Ak. Berl.* 1872, p. 852, pl. i, fig. 2; *Murray, Zool. Sind*, p. 391; *Boettg. Ber. Offenb. Ver.* 1888, p. 89, *and Zool. Anz.* 1888, p. 396.

Leioselasma striata, *Lacép. Ann. Mus.* iv, 1804, pp. 198, 210, pl. lvii, fig. 1.

Hydrophis striata, *Schleg. Faun. Japon., Rept.* p. 89, pl. vii; *id. Phys. Serp.* ii, p. 502, pl. xviii, figs. 4 & 5.

Hydrophis sublævis, *Gray, Zool. Misc.* p. 62.

Hydrophis subannulata, *Gray, Cat. Sn.* p. 54.

Hydrophis aspera, *Gray, Cat. Sn.* p. 55; *Günth. l. c.* p. 365.

Hydrus striatus, *Cantor, J. A. S. B.* xvi, 1847, p. 1047.

Hydrophis striatus, part., *Dum. & Bibr. Erp. Gén.* p. 1347.

Hydrophis westermanni, *Jan, Icon. Ophid.* 39, pl. v, fig. 1.

Hydrophis taprobanica, *Haly, Taprobanian*, ii, 1887, p. 107.

Head moderate; body elongate. Rostral slightly broader than deep; nasals shorter than the frontal, twice, or rather more than twice, as long as the suture between the præfrontals; frontal much longer than broad, as long as its distance from the end of the snout or a little shorter, shorter than the parietals; one præ- and two postoculars; 7 or 8 upper labials, second largest, third and fourth, or third, fourth, and fifth, entering the eye; two superposed anterior temporals; two pairs of subequal chin-shields, in contact on the middle line, or posterior pair separated by one scale. 27 to 33 scales round the neck, 39 to 43 round the middle of the body; scales rhomboidal and subimbricate, with a short keel, which is very strong and broken up into two or three tubercles in adult males. Ventrals distinct throughout, smooth or with two or more tubercles, 300–426. Greenish olive above, with black cross bars or annuli, broadest on the back, and sometimes joined by a black band running along the belly.

Total length 6 feet.

Hab. Persian Gulf and coasts of India to the Malay Archipelago, and China and Japan. One of the commonest species in India.

510. Distira bituberculata.

Hydrophis bituberculatus, *Peters, MB. Ak. Berl.* 1872, p. 855, pl. ii, fig. 2.

Very closely allied to *D. lapemidoides*, but scales imbricate, with the keels mostly broken up into two tubercles; 26 or 27 scales round the neck, 48 or 49 round the deepest part of the body. Ventrals distinct, 278. Dark brown above, yellowish on the sides and beneath, the skin between the scales black.

Total length 3 feet 8 inches.

Hab. Colombo; a single specimen in the Berlin Museum.

511. Distira ornata.

Aturia ornata, *Gray, Zool. Misc.* p. 61, *and Cat. Sn.* p. 45.
Hydrophis ocellata, *Gray, Cat. Sn.* p. 53; *Günth. Rept. B. I.* p. 378, pl. xxv, fig. P.
Chitulia inornata, *Gray, Cat. Sn.* p. 56.
Thalassophis schlegelii, *Schmidt, Abh. Naturw. Hamb.* ii, 2e Abth. 1852, p. 83, pl. v.
Hydrophis striatus, part., *Dum. & Bibr. Erp. Gén.* vii, p. 1347.
Hydrophis schlegelii, *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 50; *Jan, Icon. Ophid.* 40, pl. vi, fig. 1.
Hydrophis lævis, *Lütk. Vidensk. Meddel.* 1862, p. 309, pl. i, fig. 6.
Hydrophis ornata, *Günth. Rept. B. I.* p. 376, pl. xxv, fig. V; *Boettg. Zool. Anz.* 1888, p. 397.
Hydrophis ellioti, *Günth. l. c.* p. 377, pl. xxv, fig. N.
Hydrophis striatus, *Jan, Icon. Ophid.* 40, pl. v, fig. 1.

Head moderate; body moderately elongate. Rostral broader than deep; nasals shorter than the frontal, two or three times as long as the suture between the præfrontals; frontal longer than broad, as long as its distance from the end of the snout or a little longer, shorter than the parietals; one præ- and two or three postoculars; 7 or 8 upper labials, second largest, third and fourth entering the eye; two or three superposed anterior temporals; anterior chin-shields in contact, posterior chin-shields, if distinct, separated by two or three scales. 35 to 42 scales round the neck, 40 to 50 round the middle of the body; scales juxtaposed and hexagonal in the middle of the body, feebly imbricate anteriorly, smooth in the young, with a central tubercle or short keel in the adult. Ventrals distinct, but feebly enlarged, 252–300. Young with blackish cross bands, tapering on the sides, and with one or more lateral series of roundish dark spots; these bands may become confluent in some specimens, which are uniform blackish olive above and white beneath.

Total length 4 feet.

Hab. From the Persian Gulf and the coasts of India and Ceylon to New Guinea and North Australia.

Hydrophis crassicollis, Anders. J. A. S. B. xl, 1871, p. 19, and Fayrer, Thanatoph. pl. xxii, which is known to me from the

description and figure only, appears to be very closely related to, if not identical with, *D. ornata*. It is described as follows:—

"Head hardly distinct from the neck. Neck and body of nearly equal girth throughout. Round neck 2″ 2‴, round middle of body 2″ 9‴. Body elongate. 34 series of scales round the neck, 40 round the middle of the body. Scales almost smooth on the neck and anterior third of the body; two feeble keel-like tubercles, one before the other, very obscure, but more strongly developed on the two posterior thirds; ventrals twice the size of the adjoining scales, quite smooth, broken up here and there on the posterior five eighths of the body. Two pairs of anal shields, the central pair of moderate size, elongate, the external pair very large. The vertical is pointedly linguate. One præ- and two postoculars. The third, fourth, and fifth labials enter the orbit on one side, but only the third and fourth on the opposite side, the fifth being transversely divided into two shields which do not reach quite as high as the orbital margin. Two pairs of large chin-shields, the anterior pair quadrangular and the posterior pair rather elongated. Olive-yellow above, yellowish on the sides and under surface; 62 broad black bands on the back, contracting to a point on the sides, but prolonged very indistinctly on to the sides and ventral aspect, when they expand as a large blackish spot. Near the tail the dorsal bands become connected together, and their continuations on the ventral aspect follow a similar arrangement. Six black rings on the tail, confluent below; the latter third entirely black."

Total length 4½ feet.

Hab. Hooghly, below Calcutta.

512. Distira lapemidoides.

Aturia lapemoides, *Gray, Cat. Sn.* p. 46.
Hydrophis lapemoides, *Günth. Rept. B. I.* p. 375; *Blanf. J. A. S. B.* xlviii, 1879, p. 132.
Hydrophis holdsworthii, *Günth. A. M. N. H.* (4) ix, 1872, p. 33.
Hydropis stewartii, *Anders. P. Z. S.* 1872, p. 399; *Fayrer, Thanat.* pl. xxiv; *Murray, Zool. Sind,* p. 390.
Hydrophis dayanus, *Stoliezka, P. A. S. B.* 1872, p. 89; *Murray, Zool. Sind,* p. 393.

Head rather small; body elongate, slender anteriorly; diameter of neck two fifths to one third the greatest depth. Rostral slightly broader than deep; nasals shorter than the frontal, more than twice as long as the suture between the præfrontals; frontal much longer than broad, as long as its distance from the end of the snout or a little shorter, shorter than the parietals; one præ- and two postoculars; upper labials 8, second largest, third and fourth entering the eye; two or three superposed anterior temporals; two pairs of subequal chin-shields, in contact, or posterior separated by one scale. 30 to 33 scales round the neck, 43 to 47 round the middle of the body; scales rhomboidal and subimbricate on the neck, hexagonal and juxtaposed on the body, of young smooth, of adult

female with a feeble tubercle or keel, of adult male with a strong spinose tubercle. Ventrals distinct throughout, 320–387. Young greyish olive above, white beneath, with complete black rings which are broadest on the back; head black, with an angular yellow (vermilion) band above, the apex on the snout; tail black, with whitish vertical bands at the base. In the adult the bands become more obsolete and are not continued across the body, and the head is uniform olive-brown.

Total length 3 feet.

Hab. Coasts of Baluchistan, India, and Ceylon.

I regard *H. lapemoides* as the young, *H. stewartii* as the adult female, and *H. holdsworthii* as the fully developed male of one and the same species.

513. Distira viperina.

Thalassophis viperina, *Schmidt, Abh. Naturw. Hamb.* ii, 2e Abth. 1852, p. 79, pl. iii.
Disteira præscutata, *Dum. & Bibr. Erp. Gén.* vii, p. 1331*.
Hydrophis doliata, *Fischer, Abh. Naturw. Hamb.* iii, 1856, p. 56.
? Hydrophis obscurus (*non Daud.*), *Jan, Rev. et Mag. Zool.* 1859, p. 151; *id. Icon. Ophid.* 40, pl. vi, fig. 2.
Hydrophis viperina, *Günth. Rept. B. I.* p. 378; *Anders. P. Z. S.* 1872, p. 400.
Hydrophis jayakari, *Bouleng. A. M. N. H.* (5) xx, 1887, p. 408.
Hydrophis plumbea, *Murray, Journ. Bomb. N. H. Soc.* ii, 1887, p. 34.

Head rather small; body moderately elongate, rather slender anteriorly. Rostral as deep as broad; nasals as long as or a little shorter than the frontal; suture between the præfrontals very short; frontal as broad as long, as long as its distance from the rostral or end of the snout, shorter than the parietals; one or two præ- and one or two postoculars; 7 or 8 upper labials, second largest, fourth or third and fourth entering the eye; one or two anterior temporals; two pairs of chin-shields, in contact with each other, posterior longer. 27 to 29 scales round the neck, 37 to 43 round the middle of the body; scales juxtaposed, obtusely keeled. Ventrals large anteriorly, bituberculate in the male, 237–267. Slaty grey above, with rhomboidal transverse black spots, white or pink on the sides and beneath; some specimens uniform dark grey above; in the young, the black spots are continued down the sides of the body; end of tail black.

Total length 3 feet.

Hab. From the Persian Gulf and the Makrán coast, round the coasts of India and Burma to Java, Hong Kong, and Hainan.

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* I have examined the type specimen in the Paris Museum.

Family VIII. AMBLYCEPHALIDÆ.

Facial bones movable; transpalatine present; pterygoid short, not extending to quadrate or mandible; supratemporal present, small; maxillary horizontal, converging posteriorly towards palatines. Mandible without coronoid bone. Both jaws toothed; teeth all solid.

Externally, these snakes are distinguished from the Dipsadine *Colubridæ*, to which they bear some resemblance, by the absence of a mental groove. The mouth is susceptible of but slight expansion, the snakes of this group feeding upon small prey. The large size of the eye and the vertical pupil indicate nocturnal habits.

The *Amblycephalidæ* are represented in the East Indies (*Amblycephalus*, *Haplopeltura*) and in Tropical America (*Dipsadomorus*, *Leptognathus*).

Genus AMBLYCEPHALUS,

Kuhl, in Férussac, Bull. Sc. Nat. ii, 1824, p. 81; Boie, Isis, 1827, p. 519*.

Maxillary teeth few, small, without grooved fangs; anterior mandibular teeth longest. Head distinct from neck, with short,

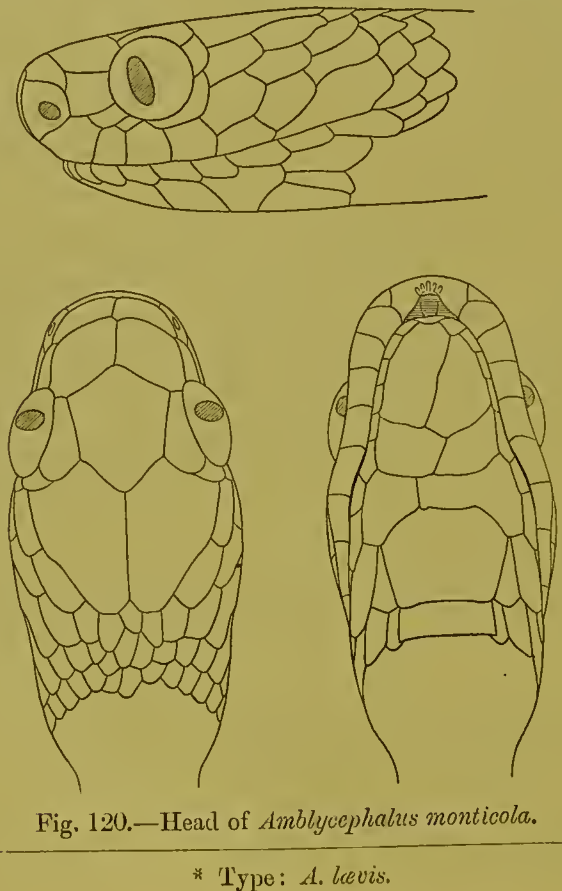

Fig. 120.—Head of *Amblycephalus monticola*.

* Type: *A. lævis*.

broad snout; eye moderate and with vertically elliptical pupil; head-shields large. Body moderate or slender, compressed; scales smooth or feebly keeled, in 15 rows, without pits; ventrals rounded; tail moderate or short, prehensile; subcaudals in two rows.

Distribution. This genus includes eight species, inhabiting Southern China, Burma, the Eastern Himalayas, Assam, Cochinchina, Siam, the Malay Peninsula, and the Malay Archipelago. They are nocturnal and feed on insects.

Synopsis of Indian and Burmese Species.

A. Scales of vertebral row enlarged; a single shield between nasal and eye, which rests on one or more labials.
  a. Frontal longer than broad; ventrals 188–194; subcaudals 70–87 .... *A. monticola*, p. 415.
  b. Frontal as broad as long; ventrals 150–176; subcaudals 34–46 .... *A. lævis*, p. 415.
B. Scales of vertebral row not enlarged; loreal and præocular distinct; eye separated from labials by one or more suboculars.
  a. One præocular, one postocular, and one subocular .... *A. andersonii*, p. 416.
  b. Two præoculars, one postocular, and one subocular .... *A. modestus*, p. 416.
  c. One præocular, one postocular, and 3 or more suboculars .... *A. macularius*, p. 416.

514. Amblycephalus monticola.

Dipsas monticola, *Cantor, P. Z. S.* 1839, p. 53.
Pareas monticola, *Günth. Rept. B. I.* p. 327; *Anders. P. Z. S.* 1871, p. 188; *Theob. Cat.* p. 203.

Internasals not quite half as long as the prefrontals; latter entering the eye; frontal a little longer than broad, a little shorter than the parietals; loreal entering the eye; a small præocular below the loreal; two postoculars; temporals 2+3; upper labials 7, fourth or fourth and fifth entering the eye; three pairs of large chin-shields. Scales in 15 rows, smooth; vertebrals enlarged, hexagonal. Ventrals 188–194; anal entire; subcaudals 70–87. Brown above, with vertical blackish bars on the sides; a black line from above the eye to the nape, and another from behind the eye to the angle of the mouth; yellowish below, dotted with brown.

Total length 2 feet; tail $5\frac{1}{2}$ inches.

Hab. Eastern Himalayas, Khási and Nága Hills.

515. Amblycephalus lævis.

Amblycephalus lævis, *Boie, Isis,* 1827, p. 520.
Pareas lævis, *Dum. & Bibr. Erp. Gén.* vii, p. 442; *Günth. Rept. B. I.* p. 328; *Theob. Cat.* p. 203.
Leptognathus lævis, *Jan, Icon. Ophid.* 37, pl. vi, fig. 4.

Internasals small, about one third the length of the præfrontals; the latter entering the eye, between the præocular and the supraocular; frontal as broad as long, two thirds the length of the parietals; supraocular very small; no præocular; loreal entering the eye; one or two postoculars; temporals 2+2; upper labials 6, third and fourth, or third, fourth, and fifth, entering the eye, sixth very long; three pairs of large chin-shields. Scales in 15 rows, smooth; vertebrals slightly enlarged. Ventrals 150–176; anal entire; subcaudals 34–46. Brown above, with irregular transverse blackish cross bands; lower parts brownish or yellowish, with transverse brown spots on the sides.

Total length 16 inches; tail 3.

Hab. Java, Borneo, and Malacca. This species is said to occur also in the Khási Hills, a statement which may be due to confusion with the allied *A. monticola.*

516. Amblycephalus andersonii.

Pareas andersonii, *Bouleng. Ann. Mus. Genova,* (2) vi, 1888, p. 601, pl. v, fig. 3.

Internasals small, about one third the length of the præfrontals; the latter entering the eye, between the præocular and the supraocular; frontal slightly longer than broad, two thirds the length of the parietals; supraocular moderate, not quite half the width of frontal; a small loreal; a præocular, a postocular, and a band-like subocular, excluding the labials from the eye; temporals 2+3; upper labials 7, seventh very long; three pairs of large chin-shields. Scales in 15 rows, dorsals feebly keeled. Ventrals 153–155; anal single; subcaudals 38–46. Dark brown above, with distant small black spots with a white dot; labial region spotted black and white; lower parts white, with closely-set squarish black spots.

Total length 14 inches; tail 2.

Hab. Upper Burma (Bhámo, and Kakhyen Hills).

517. Amblycephalus modestus.

Pareas modestus, *Theob. Journ. Linn. Soc.* x, 1868, p. 55; *id. Cat.* p. 204.

Internasals small; præfrontals large, entering the eye; supraocular small; loreal moderate; præoculars two, very small; postocular one, very small; a band-like subocular, excluding the labials from the orbit; two anterior temporals; 7 upper labials, seventh very long; three pairs of large chin-shields. Scales in 15 rows, dorsals faintly keeled. Colour above uniform brown; below pale yellowish.

Hab. Pegu. Unknown to me.

518. Amblycephalus macularius.

Pareas macularius, *Theob. Journ. Linn. Soc.* x, 1868, p. 54.
Pareas berdmorii, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 63.
Pareas margaritophorus (*non Jan*), *Theob. Cat.* p. 203.

Internasals about half the length of the præfrontals; the latter entering the eye, between the præocular and the supraocular; frontal longer than broad, a little shorter than the parietals: supraocular moderate, nearly half the width of the frontal; a small loreal; one præocular, one postocular, and three or more suboculars, excluding the labials from the eye; temporals 2+2; upper labials 7, seventh very large; three pairs of large chin-shields. Scales in 15 rows, dorsals faintly keeled. Ventrals 164; anal entire; subcaudals 51. Pale brown or reddish brown above, with transverse series of dark brown and white spots; lower parts brownish white, spotted with brown.

Total length 16 inches; tail 2·5.

Hab. Tenasserim.

Family IX. VIPERIDÆ.

Facial bones movable; transpalatine present; pterygoid extending to mandible; supratemporal present, attached scale-like to the skull and supporting the quadrate; maxillary short and thick, movable perpendicularly to the transpalatine, and bearing a pair of large canaliculate fangs. Mandible without coronoid bone, armed with solid teeth.

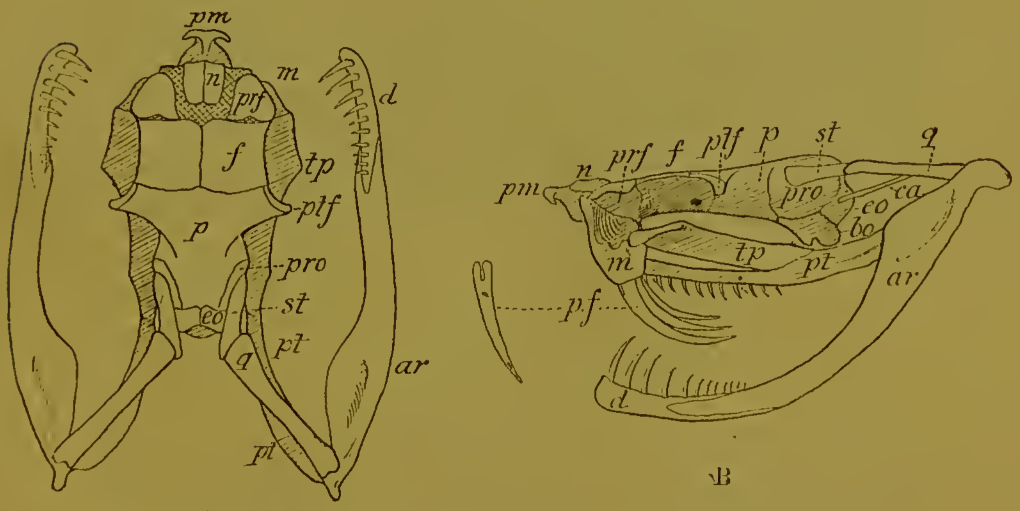

Fig. 121.—Skull of *Trimeresurus gramineus.*

A. Upper view. B. Side view.

ar. Articular.
bo. Basioccipital.
ca. Columella auris.
d. Dentary.
eo. Exoccipital.
f. Frontal.
m. Maxillary.
n. Nasal.
p. Parietal.
pf. Poison-fang.
pm. Præmaxillary.
prf. Præfrontal.
pro. Prootic.
pt. Pterygoid.
ptf. Postfrontal.
q. Quadrate.
st. Supratemporal.
tp. Transpalatine.

All the snakes of this family are poisonous, and some kinds are amongst the most deadly known. Of the Indian forms, *Vipera russellii* is, after the Cobra, the most dangerous poisonous snake; next comes the little *Echis carinata*, which is also highly poisonous, though less dangerous to man on account of its small size. The Indian *Trimeresuri* have comparatively much smaller poison-glands, and it has been repeatedly ascertained that their bite does not produce death in man and large animals. The *Viperidæ* are semi-nocturnal, all having the pupil vertically elliptical, and, as far as ascertained, their young are brought forth alive.

The *Viperidæ* are divided into two very distinct subfamilies: the Vipers proper, *Viperinæ*, and the Pit-Vipers, *Crotalinæ*, the latter being distinguished by the presence of a deep pit on each side of the snout, between the eye and the nostril. The physiological significance of this pit is still unknown. The *Viperinæ* are confined to the Old World, and most abundant in Africa. The *Crotalinæ*, of which the Rattle-Snakes are the type genus, are American (ranging from the United States to Patagonia) and Asiatic.

Synopsis of the Subfamilies and Indian and Burmese Genera.

A. No loreal pit: *Viperinæ*.
- *a*. Head with large symmetrical shields .... AZEMIOPS, p. 418.
- *b*. Upper surface of head covered with scales or small shields.
  - *a'*. Lateral series of scales running in straight longitudinal lines .... VIPERA, p. 419.
  - *b'*. Lateral scales disposed obliquely; subcaudals in a single row .... ECHIS, p. 421.

B. A deep pit between the nostril and the eye: *Crotalinæ*.
- *a*. Head with large symmetrical shields .... ANCISTRODON, p. 423.
- *b*. Upper surface of head covered with scales TRIMERESURUS, p. 425.

Subfamily I. VIPERINÆ.

Genus AZEMIOPS,

Boulenger, Ann. Mus. Genova, (2) vi, 1888, p. 602.

Head with large symmetrical shields; loreal shield present. Scales smooth, in 17 rows. Subcaudals in two rows.

Only one species, which strikingly resembles a harmless Colubroid in external appearance.

519. Azemiops feæ.

Azemiops feæ, *Bouleng. Ann. Mus. Genova,* (2) vi. 1888, p. 603, pl. vii.

Head elliptical, snout short and broad; rostral broader than

deep; internasals and præfrontals subequal in length; frontal a little broader than long; parietals as long as their distance from the end of the snout; loreal small, pentagonal, deep as long; two or three præoculars; two subequal postoculars; two large superposed anterior temporals, the upper alone in contact with the postoculars; 6 upper labials, third entering the orbit, first and second smallest, fourth and fifth largest; 7 lower labials, first large and forming a long suture

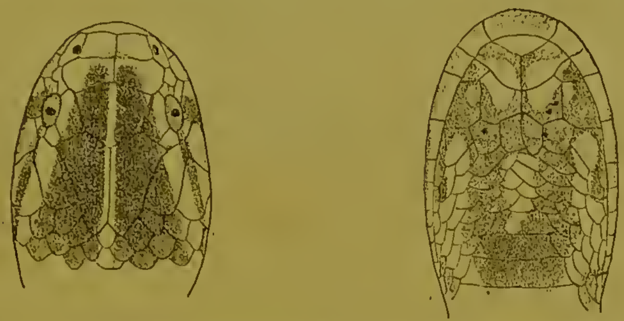

Fig. 122.—Head of *Azemiops feæ*. Upper and lower view.

with its fellow, second small; a pair of short chin-shields. Dorsal scales equal, smooth, in 17 longitudinal series. Ventrals 180; anal single; subcaudals 42. Blackish above, the scales being dark grey in the centre and black on the borders, with 15 transverse white bands, one scale wide, some of which are disconnected in the middle and alternate with those on the other side; upper surface of head, from the præfrontals, black, with a yellow median line, which is very narrow anteriorly and widens posteriorly, ending on the neck on the eleventh transverse series of scales; end of snout and sides of head yellow; a blackish streak from below the eye to the lower border of the fourth upper labial; another from the postoculars to the upper border of the sixth labial. Lower parts olive-grey, with some small lighter spots; chin and throat variegated with yellow.

Total length 2 feet; tail 3·5 inches.

Hab. Kakhyen Hills, Upper Burma. A single specimen is known.

Genus VIPERA,

Laurenti, Syn. Rept. p. 99, 1768.

Upper surface of head covered with scales or small shields. Scales keeled, in 21 to 38 straight longitudinal rows. Subcaudals in two rows.

Distribution. This genus, which comprises about 20 species, ranges over the whole of Africa (but not Madagascar), Europe, Northern, Central, and South-Western Asia, and is represented in India by a single species; a second species reaches the eastern limit of its distribution in Baluchistan, Afghanistan, and Kashmir.

These two species are distinguished as follows :—

Rostral as deep as broad ; scales in 27–31 rows .... *V. russellii*, p. 420.
Rostral a little broader than deep ; scales in 23–27 rows *V. lebetina*, p. 421.

520. Vipera russellii.

Russell, Ind. Serp. i, pl. vii, and ii, pl. xxxii.
Coluber russellii, *Shaw, Nat. Miscell.* viii, pl. ccxci.
Vipera elegans, *Daud. Rept.* vi, p. 124, pl. lxxiii ; *Jan, Icon. Ophid.* 45, pl. vi, fig. 2.
Echidna elegans, *Merr. Tent.* p. 153 ; *Dum. & Bibr.* vii, p. 1435.
Daboia russellii, *Gray, Cat. Sn.* p. 24 ; *Günth. Rept. B. I.* p. 396 : *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 226 ; *Fayrer, Thanatoph.* pl. xi ; *Theob. Cat.* p. 217 ; *Anders. An. Zool. Res. Yunnan*, p. 833.
Vipera russellii, *Strauch, Mém. Ac. St. Pétersb.* 7, xiv, no. 6, *Syn. Viper.* p. 85.

Snout obtuse ; nostrils very large, between three shields ; rostral about as deep as broad ; a narrow supraocular shield ; upper surface of head covered with small imbricate, strongly keeled scales, in 6 to 8 longitudinal series between the supraoculars ; three or

Fig. 123.—*Vipera russellii.*

four series of scales between the eye and the labials ; 11 or 12 upper labials, fourth largest. Scales sharply keeled, in 27 to 31 rows. Ventrals 163–172 ; anal entire ; subcaudals 45–60.

Pale brown above, with three longitudinal series of black, light-edged rings; in some specimens, however, these elegant markings are replaced by faint dark spots; in the young, these black rings encircle dark reddish-brown spots, and those of the vertebral series are in contact with one another; lower parts yellowish white, uniform or with crescentic small black spots.

Total length 4 feet; tail 7 inches.

Hab. India, Ceylon, Burma, and Siam. In the Himalayas this viper reaches up to 5000 feet in the Kulu Valley, and up to 6000 feet in Cashmir. It is also recorded from Sumatra and Java, but upon somewhat doubtful data.

Vipera russellii is one of the most deadly snakes of India. It is of sluggish habits and will frequently not move out of the way on the approach of a man.

521. Vipera lebetina.

Coluber lebetinus, *Linn. Syst. Nat.* i, p. 378; *Forskål, Descr. Anim.* p. 13.

Vipera lebetina, *Daud. Rept.* vi, p. 137; *Jan, Icon. Ophid.* 46, pl. vi, fig. 1.

Vipera obtusa, *Dwigubsky, Essay, Nat. Hist. Russ. Emp.* (Russian), 1832, p. 30; *Blanf. Zool. E. Pers.* p. 428; *id. 2nd Yark. Miss., Rept.* p. 24.

Vipera euphratica, *Martin, P. Z. S.* 1838, p. 82.

Echidna mauritanica, *Guichenot, Explor. Sc. Alg., Rept.* p. 24, pl. iii.

Snout obtuse; nostrils large, between three shields; rostral a little broader than deep; a narrow supraocular shield is present or absent; upper surface of head covered with small imbricate strongly keeled scales, 9 to 12 across the forehead, from eye to eye; three or four series of scales between the eye and the labials; three or four scales in a line from the posterior nasal to the eye; 10 to 12 upper labials, fourth usually largest. Scales strongly keeled, in 23 to 27 rows. Ventrals 154–180; anal entire; subcaudals 42–48. Pale grey-brown above, with darker spots or cross bands, which are distinct in the young, but feebly marked or absent in the adults; lower parts whitish, powdered with grey.

Total length 5 feet.

Hab. North Africa and South-western Asia, from Algeria and Cyprus (also the Greek island Milo) to Northern Baluchistan (Quetta), Afghanistan, and Kashmir.

Genus ECHIS,

Merrem, Tent. Syst. Amph. p. 149, 1820.

Upper surface of head covered with scales. Scales keeled, in 25 to 35 rows, the laterals disposed obliquely. Subcaudals in a single row.

Two species are known, the second, *E. colorata*, Gthr., inhabiting Arabia and Palestine.

522. Echis carinata.

Russell, Ind. Serp. i, pl. ii; *Geoffr. Descr. Egypte,* pl. vii, fig. 1.
Pseudoboa carinata, *Schneid. Hist. Amph.* ii, p. 285.
Echis carinata, *Merr. Tent.* p. 149; *Dum. & Bibr. Erp. Gén.* vii, p. 1448, pl. lxxxi bis, fig. 3; *Günth. Rept. B. I.* p. 397; *Fayrer, Thanatoph.* pl. xii; *Anders. P. Z. S.* 1871, p. 196; *Blanf. Zool. E. Pers.* p. 430; *Theob. Cat.* p. 218; *Blanf. J. A. S. B.* xlviii, 1879, pt. 2, p. 116; *Murray, Zool. Sind,* p. 388, pl.—.
Echis arenicola, *Boie, Isis,* 1827, p. 558.

Head distinct from neck; snout very short and rounded; nostril between three shields; head covered with small keeled scales, among which an enlarged supraocular is sometimes present; 10 to 15 scales across the forehead, from eye to eye; two series of scales between the eye and the labials; 11 or 12 upper labials, fourth usually largest. Scales strongly keeled, the keel on the lateral scales serrated, saw-like; 25 to 29 scales round the anterior part of the body, 29 to 35 round the middle. Ventrals 138–185; anal

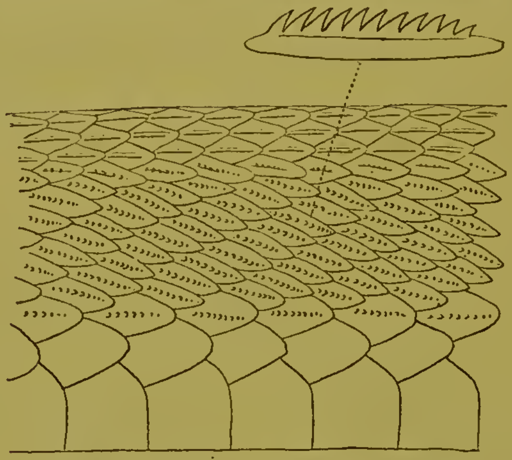

Fig. 124.—Scales of *Echis carinata.*

entire; subcaudals 21–40. Pale buff, greyish, reddish, or pale brown above, with three series of whitish spots edged with dark brown; a zigzag dark brown band may run along each side; a cruciform or ⅄-shaped, whitish, dark-edged marking on the head; lower parts whitish, uniform or with brown dots.

Total length 2 feet; tail 2·5 inches.

Hab. The desert sandy districts of North Africa, South-Western Asia, and India. Blanford records the exceptional occurrence of this species between Dumagudem and Ellore, in thin forest, the soil of which is, however, very sandy. It appears to be found, though rarely, in South-western Bengal, but it is common in the North-west Provinces, the Central Provinces, the Punjab, Sind, and Cutch; and it occurs as far south as the Carnatic. It is also said to be common in parts of the Concan, south of Bombay. This small viper is very fierce and aggressive, and Sir J. Fayrer's experiments have shown its poison to be very active, killing a fowl in about two minutes, and a dog in about four hours.

Dr. Anderson was the first to notice that this viper makes a curious, prolonged, almost hissing sound by rubbing the folds of the sides of its body against one another. This sound is produced by friction between the serrated keels of the lateral scales, which, as noticed and figured above, are disposed obliquely with their tips directed downwards and backwards; the noise can even be produced after the death of the animal by twisting the body and thus rubbing or rasping these little saws against one another. A similar arrangement of the scales is found in the African genera *Dasypeltis* and *Cerastes*.

Subfamily II. CROTALINÆ.

Genus **ANCISTRODON,**

Palisot de Beauvois, Tr. Am. Philos. Soc. iv. 1799, p. 381.

Head with large symmetrical shields above. Tail ending in a point; subcaudal shields in two rows in the Asiatic species *.

North and Central America and Asia. 9 or 10 species are known. Terrestrial.

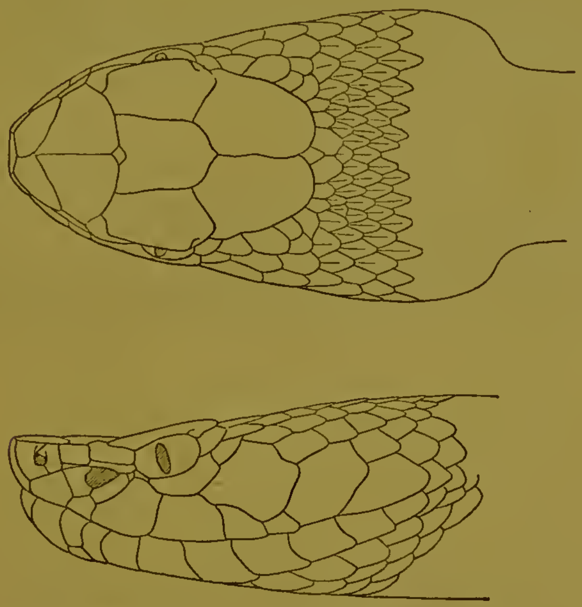

Fig. 125.—Head of *Ancistrodon himalayanus*.

Two species in India:—

Two pairs of large shields on the snout	*A. himalayanus*, p. 424.
Upper surface of snout covered with small shields	*A. hypnale*, p. 424.

* A few of the shields may be single.

523. Ancistrodon himalayanus.

Halys himalayanus, *Günth. Rept. B. I.* p. 393, pl. xxiv, fig. A; *Stoliczka, J. A. S. B.* xxxix, 1870, p. 226; *Anders. P. Z. S.* 1871, p. 196, and 1872, p. 401; *Fayrer, Thanatoph.* pl. xvi; *Theob. Cat.* p. 225; *Blanf. Zool. 2nd Yark. Miss., Rept.* p. 24.
Trigonocephalus blomhoffii (*non Boie*), *Jan, Icon. Ophid.* 46, pl. v, figs. 4, 5.

Snout hardly turned up, with sharp canthus rostralis; rostral as deep as broad or a little broader than deep; a pair of præfrontals, and a pair of internasals in contact with each other; two postoculars, upper small, lower descending to below the eye, which it sometimes entirely separates from the labials; 5 to 7 upper labials, none entering the loreal pit, the penultimate very large, formed by fusion with the lower temporals. Scales sharply keeled, in 21 or 23 rows. Ventrals 144–166; anal entire; subcaudals 35–51 pairs. Brown, with black spots or transverse bands; sometimes with a light vertebral band with dark festooned borders; a black, light-edged band from the eye to the angle of the mouth; lower parts dark brown or variegated with black and white.

Total length 34 inches.

Hab. Very common all over the North-western Himalayas, especially between 5000 and 8000 feet, and ascending even to 10,000 feet; also recorded from Sikhim, and specimens in the British Museum are stated to have been collected by Jerdon in the Khási Hills.

524. Ancistrodon hypnale.

Russell, Ind. Serp. ii, pl. xxii.
? Coluber nepa, *Laur. Syst. Rept.* p. 97.
Cophias hypnale, *Merr. Tent.* p. 155.
Trigonocephalus hypnale, *Schleg. Phys. Serp.* ii, p. 550, pl. xx, figs. 6 & 7; *Dum. & Bibr. Erp. Gén.* vii, p. 1498; *Jan, Icon. Ophid.* 46, pl. v, figs. 2, 3.
Trimesurus ceylonensis, *Gray, Zool. Misc.* p. 49.
Trigonocephalus zara, *Gray, Cat. Sn.* p. 15.
Hypnale nepa, *Cope, Proc. Ac. Philad.* 1859, p. 335; *Günth. Rept. B. I.* p. 394; *Fayrer, Thanatoph.* pl. xvii; *Theob. Cat.* p. 226.
Hypnale affinis, *Anders. J. A. S. B.* xl, 1871, pt. 2, p. 20.

Snout more or less turned up at the end, with sharp canthus rostralis; rostral as deep as broad or deeper than broad; upper surface of snout covered with small shields, which are often irregular and scale-like; one or two postoculars and one or two suboculars; 7 or 8 upper labials, second entering the loreal pit, none entering the eye. Scales more or less distinctly keeled, in 17 or 19 rows. Ventrals 140–155; anal entire; subcaudals 31–45 pairs. Coloration very variable: upper parts brown, yellowish, or greyish, uniform, or with blackish-brown alternating spots or cross bands, frequently with small deep black spots disposed in pairs; sides of head usually dark brown, edged above with a fine whitish line;

sometimes a white black-edged longitudinal streak on each side of the neck; belly more or less closely powdered with dark brown.

Total length 19 inches; tail 2·5.

Hab. The "Karawala" is found in Ceylon and in the Western Ghâts of India as far north as Bombay. Its bite is said to be but exceptionally fatal to man.

Lachesis

Genus ~~TRIMERESURUS~~,

Lacépède, Ann. du Mus. iv, 1804, pp. 196, 209 (part.).

Head covered with scales above. Tail often prehensile, ending in a point; subcaudal shields in two rows in the Asiatic species.

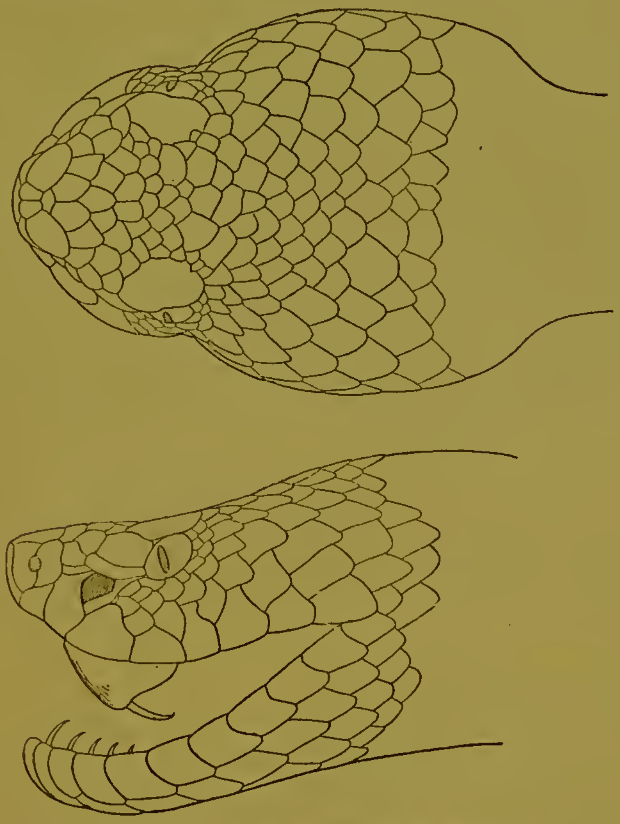

Fig. 126.—Head of *Trimeresurus monticola*.

Distribution. East Indies, Southern China, and Loo Choo Islands*, Tropical America. About 25 species are known.

This genus includes terrestrial and arboreal species, but the two divisions are so insensibly blended as to render their distinction almost impossible.

* *T. flavoviridis*, Hallow. (= *T. riukianus*, Hilgend.).

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Scales in 21 or 23 rows; 5 to 11 scales in a transverse series between supraoculars; tail not prehensile.
  a. Supraoculars large, separated by 5 to 8 series of scales; scales feebly keeled .... *T. monticola*, p. 426.
  b. Supraoculars small, sometimes broken up, separated by 8 to 11 series of scales; scales feebly keeled .... *T. strigatus*, p. 427.
  c. Supraoculars large; scales strongly keeled. . *T. jerdonii*, p. 427.
B. Scales in 25 to 31 rows; 12 to 16 scales in a transverse series between the supraoculars; tail slightly prehensile.
  a. Ventrals 200–218; subcaudals 76–92; scales strongly keeled, in 25 or 27 rows........ *T. mucrosquamatus*, [p. 428.
  b. Ventrals 174–184; subcaudals 55–76; scales rather feebly keeled, in 27 to 31 rows.... *T. cantoris*, p. 428.
  c. Ventrals 160–182; subcaudals 53–75; scales strongly keeled, in 25 or 27 rows........ *T. purpureomaculatus*, [p. 429.
C. Scales in 13 to 23 rows; tail prehensile.
  a. 7 to 13 scales in a transverse series between supraoculars; scales in 19 to 23 rows.
    a'. Subcaudals 53–75; temporal scales smooth. *T. gramineus*, p. 429.
    b'. Subcaudals 44–58; temporal scales obtusely keeled .... *T. anamallensis*, [p. 430.
  b. 4 or 5 scales in a transverse series between supraoculars; scales in 17 or 19 rows; last ventral shield notched or divided .... *T. trigonocephalus*, [p. 431.
  c. Upper head-scales very large, shield-like; scales in 13 or 15 rows .... *T. macrolepis*, p. 431.

525. Trimeresurus monticola.

Parias maculata, *Gray, A. M. N. H.* (2) xii, 1853, p. 392 (*nec Gray*, 1842).
Trimeresurus monticola, *Günth. Rept. B. I.* p. 388, pl. xxiv, fig. B; *Stoliczka, J. A. S. B.* xl, 1871, p. 445; *Fayrer, Thanatoph.* pl. xv; *Theob. Cat.* p. 220; *Anders. An. Zool. Res. Yunnan*, p. 832, pl. lxxvi, figs. 4 & 5.
Trimeresurus convictus, *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 224, pl. xii, fig. 1; *Anders. P. Z. S.* 1871, p. 196.
Trimeresurus monticola, part., *Anders. P. Z. S.* 1871, p. 194.

Snout very short; eye very small. Rostral as deep as broad; upper head-scales small, subimbricate, smooth; supraocular large, more than twice the size of the eye; internasals separated from each other by one to three scales, rarely in contact; 5 to 8 scales on a transverse line between the supraoculars; 3 or 4 rows of scales between the eye and the labials; 8 or 9 upper labials, second usually forming the anterior border of the loreal pit; temporal scales smooth. Scales feebly keeled, in some specimens almost smooth, in 21 to 23 rows. Ventrals 132–156; anal entire; subcaudals 21–57 pairs. Brown or yellowish above, with one or two dorsal series of large squarish dark brown spots and a lateral series of smaller spots;

head dark brown above, pale or yellowish on the sides, with a dark brown temporal streak; lower parts whitish, spotted or powdered with brown.

Total length 2 feet; tail 3·5 inches.

Hab. This species is known from the Central and Eastern Himalayas, from 2000 to 8000 feet, and the hills of Assam, Upper Burma, and Yunnan; Muleyit, Tenasserim, 4500 feet (*Beddome*); Penang (*Stoliczka*); Singapore.

526. Trimeresurus strigatus.

Trimeresurus strigatus, *Gray, Zool. Misc.* p. 49; *id. Cat. Sn.* p. 10; *Günth. Rept. B. I.* p. 389, pl. xxiv, fig. D; *Fayrer, Thanatoph.* pl. xvi; *Theob. Cat.* p. 224.

Trigonocephalus (Cophias) neelgherriensis, *Jerdon, J. A. S. B.* xxii, 1854, p. 524.

Rostral broader than deep; upper head-scales small, smooth, juxtaposed; supraocular small, sometimes broken up; no enlarged internasals; 8 to 11 scales on a line between the supraoculars; two or three small postoculars and a subocular, which is separated from the labials by one or two series of scales; the shield forming the anterior border of the loreal pit distinct from the second labial; 9 or 10 upper labials. Scales feebly keeled, in 21 rows. Ventrals 136–145; anal entire; subcaudals 31–49 pairs. Brown above, with dark brown spots, those of the median series often confluent into a zigzag band; a more or less distinct ∩-shaped light marking on the nape; a dark temporal band; belly whitish, spotted or marbled with grey or black; end of tail yellow or reddish.

Total length 19 inches; tail 2·5.

Hab. From the Bombay hills to the Anaimalais and Nilgiris, where this snake reaches an altitude of 6000 feet.

527. Trimeresurus jerdonii.

Trimeresurus jerdonii, *Günth. P. Z. S.* 1875, p. 233, pl. xxxiv.

Trimeresurus xanthomelas, *Günth. A. M. N. H.* (6) iv, 1889, p. 221.

Rostral as deep as broad or a little deeper than broad; upper head-scales very small, smooth, juxtaposed; supraoculars large, larger than the eye; one or more scales between the internasals, 7 to 9 on a line between the supraoculars; one or two small postoculars and a subocular, which is usually separated from the fourth labial by a series of small scales; 7 upper labials, second forming the anterior border of the loreal pit; a series of large temporals above the labials. Scales strongly keeled, in 21 or 23 rows. Ventrals 164–187; anal entire; subcaudals 42–67 pairs. Greenish yellow or olive above, mixed with black; a dorsal series of transverse rhomboidal reddish-brown spots edged with black; head black above, with symmetrical yellow markings; upper lip yellow,

with one or more black spots, that on the second labial being constant; belly yellow, more or less profusely spotted or marbled with black.

Total length 31 inches; tail 5.

Hab. Khási Hills. This species has recently been rediscovered at Ichang, on the Yang-tse-Kiang.

528. Trimeresurus mucrosquamatus.

Trigonocephalus mucrosquamatus, *Cantor, P. Z. S.* 1839, p. 32.
Trimeresurus mucrosquamatus, *Günth. Rept. B. I.* p. 390; *Swinhoe, P. Z. S.* 1870, p. 411, pl. xxxi; *Theob. Cat.* p. 224.

Rostral slightly broader than deep; upper head-scales extremely small, granular, smooth or obtusely keeled; supraocular narrow; 3 scales between the internasals, 14 or 15 on a line between the supraoculars; 4 or 5 minute postoculars and a subocular, which is separated from the labials by two or three series of scales; 10 or 11 upper labials, second forming the anterior border of the loreal pit. Scales strongly keeled, in 25 or 27 rows. Ventrals 200–214 (218); anal entire; subcaudals 76–92 pairs. Brownish grey above, with a dorsal series of large blackish spots and a lateral series of smaller ones; a blackish streak from the eye to the angle of the mouth; lower parts brownish, spotted with white.

Total length 3 feet 5 inches; tail 8·5 inches.

Hab. Nága Hills, Assam; Formosa. The above description is taken from specimens from the latter locality.

529. Trimeresurus cantoris.

Trigonocephalus cantori, *Blyth, J. A. S. B.* xv, 1864, p. 377.
Trimeresurus viridis, var. cantori, *Blyth, J. A. S. B.* xxix, 1860, p. 110.
Trimeresurus labialis, *Steindachn. Novara, Rept.* p. 86, pl. iii, figs. 1 & 2; *Theob. Cat.* p. 221.
Trimeresurus cantoris, *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 222, pl. xii, figs. 3 & 4; *Theob. l. c.* p. 222.

Rostral as deep as broad; upper head-scales very small, smooth, almost granular; supraocular shield distinct, narrow, sometimes divided into two; usually one or two scales between the internasals, 16 on a line between the supraoculars; two small postoculars and a subocular, which is separated from the fourth and following labials by two or three rows of scales; 13 upper labials, first confluent with nasal, second forming the anterior border of the loreal pit, fourth largest; temporals small, feebly keeled. Scales rather feebly keeled, in 27 to 31 rows. Ventrals 174–184; anal entire; subcaudals 55–76 pairs. Pale brown or dull green above, with small dark spots; a whitish streak along the outer series of scales; whitish or greenish beneath, uniform or with the base of the ventrals dark ashy or blackish.

Total length 4 feet; tail 6·5 inches.

Hab. Andaman and Nicobar Islands.

Lachesis

530. ~~Trimeresurus~~ purpureomaculatus.

Trigonocephalus purpureomaculatus, *Gray, Ill. Ind. Zool.* i, pl. lxxxi (1832).
Trimeresurus purpureus, *Gray, Zool. Misc.* p. 48 (1842); *Günth. Rept. B. I.* p. 387.
Trimesurus carinatus, *Gray, Zool. Misc.* p. 48.
Trigonocephalus puniceus (*non Reinw.*), *Cantor, J. A. S. B.* xvi, 1847, p. 1043.
Cryptelytrops carinatus, *Cope, Proc. Ac. Philad.* 1859, p. 340.
Trimeresurus porphyraceus, *Blyth, J. A. S. B.* xxix, 1861, p. 111; *Theob. J. Linn. Soc.* x, 1868, p. 64; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 218; *Theob. Cat.* p. 222.
Trimeresurus andersonii, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 75; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 216, and xl, 1871, p. 443; *Fayrer, Thanatoph.* pl. xv; *Theob. Cat.* p. 224.
Trimeresurus obscurus, *Theob. Cat. Rept. As. Soc. Mus.* p. 76.
Trimeresurus monticola, part., *Anders. P. Z. S.* 1871, p. 194.

Rostral as deep as broad; upper head-scales very small, juxtaposed, convex, or obtusely keeled; supraocular very narrow, sometimes broken up; internasals small, separated from each other by one or two scales; 12 to 15 scales on a transverse line between the supraoculars; two or three small postoculars and a subocular, which is separated from the labials by two or three series of scales; 11 to 13 upper labials, the fourth and succeeding small, the first usually fused with the nasal, the second (usually) forming the anterior border of the loreal pit; temporal scales keeled. Scales strongly keeled, in 25 or 27 rows. Ventrals 160–170 (182); anal entire; subcaudals 55–75 pairs. Dark purplish brown above, uniform or variegated with pale green; flanks usually pale green or spotted with pale green, or with a series of pale spots on the outer series of scales; olive or greenish white below, uniform or spotted with black.

Total length 3 feet 2 inches; tail 6 inches.

Hab. Malay Peninsula, Mergui, Andamans and Nicobars.

Var. **bicolor.**

Trimesurus bicolor, *Gray, A. M. N. H.* (2) xii, 1842, p. 392.
Trimeresurus carinatus, *Günth. Rept. B. I.* p. 386; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 217; *Fayrer, Thanatoph.* pl. xiii; *Theob. Cat.* p. 221.

Uniform grass-green above, with or without a series of whitish spots along the outer series of scales; uniform greenish white beneath.

Hab. Himalayas, Bengal, Assam, Burma, Sumatra.

531. Trimeresurus gramineus.

Russell, Ind. Serp. i, pl. ix, & ii, pl. xx.
Coluber gramineus, *Shaw, Zool.* iii, p. 420.
Vipera viridis, *Daud. Rept.* vi, p. 112.

Trimeresurus viridis, *Lacép. Ann. Mus.* iv, 1804, p. 209, pl. lvi, fig. 2; *Gray, Cat. Sn.* p. 7; *id. A. M. N. H.* (2) xii, 1853, p. 391.
Trigonocephalus erythrurus, *Cantor, P. Z. S.* 1839, p. 31.
Trimesurus albolabris, *Gray, Zool. Misc.* p. 48.
Trigonocephalus gramineus, part., *Cantor, J. A. S. B.* xvi, 1847, p. 1040.
Trimesurus elegans, *Gray, A. M. N. H.* (2) xii, 1853, p. 391.
Bothrops viridis, *Dum. & Bibr. Erp. Gén.* vii, p. 1512.
Trimeresurus gramineus, *Günth. Rept. B. I.* p. 385; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 216; *Anders. P. Z. S.* 1871, p. 194; *Theob. Cat.* p. 219; *Anders. Ann. Zool. Res. Yunnan*, p. 828.
Trimeresurus erythrurus, *Günth. l. c.* p. 386; *Stoliczka, l. c.* p. 217; *Fayrer, Thanatoph.* pl. xiv; *Theob. Cat.* p. 220.
Trimeresurus mutabilis, *Stoliczka, l. c.* p. 219, pl. xii, fig. 5; *Theob. l. c.* p. 223.

Rostral as deep as broad or broader than deep; upper head-scales small, smooth, imbricate; supraocular shield narrow, rarely broken up; internasals in contact or separated by one or two scales; 8 to 13 scales on a line between the supraoculars; usually one or two, rarely three, series of scales between the subocular and the labials; 9 to 12 upper labials, second usually forming the anterior border of the loreal pit, third largest; temporal scales smooth. Scales more or less distinctly keeled, in 21 (rarely 19 or 23) rows. Ventrals 145–175; anal entire; subcaudals 53–75. Upper parts usually bright green, rarely yellowish, greyish, or purplish brown, with or without black, brown, or reddish spots; usually a light, white, yellow, or red streak along the outer row of scales; end of tail frequently yellow or red; lower parts green, yellow, or whitish.

Total length $2\frac{1}{2}$ feet; tail 5·5 inches.

Hab. Southern China, Sikhim, Bengal, Assam, Burma, Cochin-China, Siam, Andamans and Nicobars, Malay Peninsula and Archipelago.

532. Trimeresurus anamallensis.

? Trigonocephalus (Cophias) malabaricus, *Jerdon, J. A. S. B.* xxii, 1854, p. 523.
? Trigonocephalus (Cophias) wardii, *Jerdon, l. c.* p. 524.
Trimeresurus anamallensis, *Günth. Rept. B. I.* p. 387, pl. xxiv, fig. C; *Fayrer, Thanatoph.* pl. xiv; *Theob. Cat.* p. 220.

Rostral slightly broader than deep; upper head-scales small, smooth or obtusely keeled, imbricate; supraocular shield rather large, broken up into two or three; internasals in contact or separated by one scale; 7 to 9 scales on a line between the supraoculars; two or three small postoculars and a subocular; the latter shield separated from the fourth and succeeding labials by two rows (rarely one) of scales; 9 or 10 upper labials, second forming the anterior border of the loreal pit, third largest; temporal scales obtusely keeled. Scales feebly keeled, in 21 (rarely 19) rows. Ventrals 138–158; anal entire; subcaudals 44–58 pairs. Green,

olive, yellowish, or reddish brown above, with more or less well defined black or reddish-brown spots; usually a series of yellow spots along each side of the belly, and a black temporal band; lower parts pale green, olive or yellow, or brown with yellow spots; tail usually black and yellow.

Total length $2\frac{1}{2}$ feet; tail 4·5 inches.

Hab. Anaimalai Hills.

533. Trimeresurus trigonocephalus.

Vipera trigonocephala, *Daud. Rept.* vi, p. 175.
Cophias nigromarginatus, *Kuhl, Beitr.* p. 90.
Megæra trigonocephala *and* M. olivacea, *Gray, Zool. Misc.* p. 49.
Bothrops nigromarginatus, *Dum. & Bibr. Erp. Gén.* vii, p. 1515.
Trimeresurus trigonocephalus, *Günth. Rept. B. I.* p. 390; *Theob. Cat.* p. 223.

Snout very short; rostral a little broader than deep; upper head-scales smooth, imbricate; internasals large, in contact with each other, sometimes fused to one shield; supraocular large, divided into two; 4 or 5 scales in a transverse series between the supraoculars; two or three small postoculars and a subocular; the latter shield usually separated from the labials by one series of scales; 9 or 10 upper labials, the second forming the anterior border of the loreal pit. Scales smooth or faintly keeled, in 17 to 19 rows. Ventrals 147–152, the last notched or divided into two; anal entire; subcaudals 57–67 pairs. Green above, uniform or with black markings, which may form wavy dorsal bands; a black temporal streak; upper surface with or without a network of black bands; ventrals yellowish, uniform or green at the base; end of tail usually black.

Total length 31 inches; tail 5.

Hab. Ceylon.

534. Trimeresurus macrolepis.

Trimeresurus macrolepis, *Beddome, Madras Journ. Med. Sc.* 1863.
Peltopelor macrolepis, *Günth. Rept. B. I.* p. 391, pl. xxiii, fig. C; *Theob. Cat.* p. 225.

Rostral a little broader than deep; nostril between two nasals; upper head-scales very large, imbricate, smooth; supraoculars very large, separated anteriorly by one scale, posteriorly by three; internasals in contact or separated by one scale; two postoculars and a subocular; the latter in contact with the third and fourth labials; 7 or 8 upper labials, the second forming the anterior border of the loreal pit. Scales very large, strongly keeled, in 13 to 15 rows. Ventrals 134–140; anal entire; subcaudals 48–56 pairs. Uniform bright green or olive above; a whitish line along the outer row of scales; pale greenish beneath.

Total length $26\frac{1}{2}$ inches; tail 5.

Hab. Anaimalai and Palni Hills, 4000–6000 feet.

BATRACHIA.

This Class is intermediate between the Reptiles and the Fishes. From the latter, Batrachians are distinguished by the structure of the limbs, which, as in higher Vertebrates, consist of a proximal element (humerus, femur), two propodials (radius and ulna, tibia and fibula), a carpus or tarsus, metacarpals or metatarsals, and phalanges; from the former, they are distinguished, as far as existing forms are concerned, by the absence of a basioccipital ossification, the articulation of the skull with the vertebral column being by means of two condyles furnished by the exoccipitals, by the absence of amnion or allantois in the embryo, and, with a few exceptions, by the passage through a larval, branchiferous stage after leaving the egg, or by undergoing what are called " metamorphoses." The body is naked, or, if scales are present, these are imbedded in the skin. However, the extinct Labyrinthodons or *Stegocephala* agree with the Reptiles in the possession of an ossified basioccipital, and a nearly complete passage appears to be effected from the Batrachians to the Reptiles through that group and the *Rhynchocephalia.* Leaving aside the *Stegocephala*, Batrachians may be divided into three Orders, viz.:—

I. ECAUDATA, Frogs and Toads.

II. CAUDATA, Newts and Salamanders.

III. APODA, Cæcilians.

All three of which are represented in the Oriental Region.

Order I. ECAUDATA.

Four limbs and no tail. Radius and ulna and tibia and fibula confluent; metatarsus (astragalus and calcaneum) elongate, forming an additional segment in the hind limb. Frontal bones confluent with parietals.

The body is short, the dorsal vertebral column consisting of but eight præsacral vertebræ (exceptionally seven, through fusion), and the coccygeal vertebræ are confluent into a single styloid bone. The young usually pass through lengthy metamorphoses, the earlier stages of which are known as "tadpoles." In the tadpole, or fish-like form, the head and body are globular, with external or internal gills, limbs are absent and a tail is present; the hind and fore limbs appear successively and the tail is gradually absorbed, after which last transformation the young leaves the water.

The ova of Batrachia are usually, like those of fish, small, very numerous, enveloped in mucilage, and deposited in the water. But there are many exceptions, especially among the arboreal forms, some of which have large eggs with large vitelline mass, in which the young pass rapidly through part or all of the metamorphoses. Unfortunately, hardly anything is known of the development of the Indian species.

About 960 species of Tailless Batrachians are known, being found all over the world wherever insect-food is procurable; they are most abundant in the tropics, and India and its dependencies alone furnish a list of 124 species.

This Order is divided into two Suborders:—

I. *PHANEROGLOSSA*, with a tongue and separate inner ear-openings.

II. *AGLOSSA*, without tongue and with a single median opening to the Eustachian tubes.

The latter Suborder comprises the African *Xenopus* and the South-American *Pipa*. The Indian Batrachians fall into the following groups of the Suborder *Phaneroglossa*:—

Series A. FIRMISTERNIA.

Coracoids firmly united by a simple epicoracoid cartilage; præcoracoids, if present, each resting with its distal extremity upon the coracoid, or connected with the latter by the epicoracoid cartilage (see fig. 127, p. 434).

Upper jaw toothed; diapophyses of sacral vertebra cylindrical or very slightly dilated. Fam. 1. **Ranidæ**, p. 435.

Jaws toothless; diapophyses of sacral vertebra dilated .... Fam. 2. **Engystomatidæ**, [p. 489.

Upper jaw toothed; diapophyses of sacral vertebra dilated .... Fam. 3. **Dyscophidæ**, [p. 498.

Series B. ARCIFERA.

Coracoids and præcoracoids connected by an arched cartilage (the epicoracoid), that of the one side overlapping that of the other (see fig. 138, p. 499).

Jaws toothless; diapophyses of sacral vertebra dilated .... Fam. 4. **Bufonidæ**, p. 499.

Upper jaw toothed; diapophyses of sacral vertebra dilated; distal phalanges claw-shaped. Fam. 5. **Hylidæ**, p. 509.

Upper jaw toothed; diapophyses of sacral vertebra strongly dilated.............. Fam. 6. **Pelobatidæ**, p. 510.

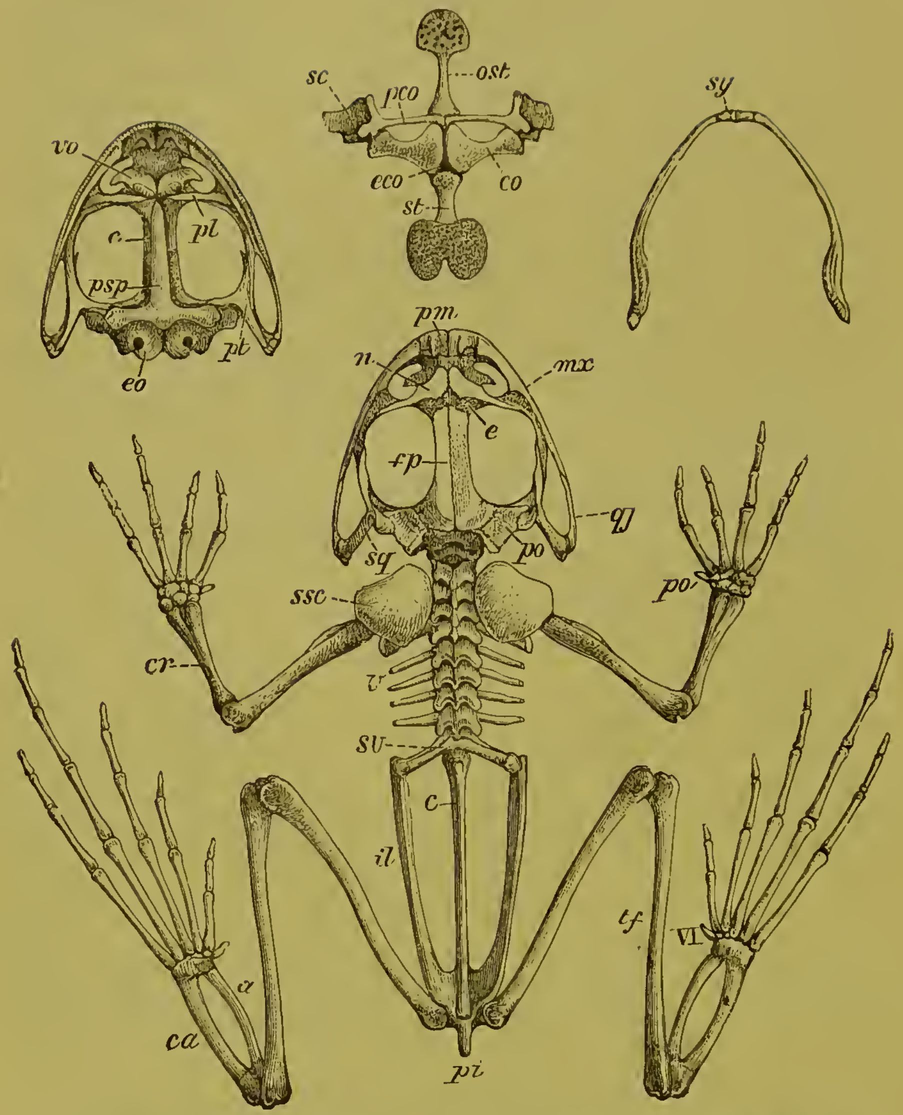

Fig. 127.—Skeleton of *Rana esculenta.* (Guide to Reptile Gallery B.M.)

a. Astragalus.
c. Coccyx.
ca. Calcaneum.
co. Coracoid.
cr. Radius-ulna.
e. Ethmoid.
eco. Epicoracoid.
eo. Exoccipital.
fp. Frontoparietal.
il. Ilium.
mx. Maxillary.
n. Nasal.
ost. Omosternum.
pco. Præcoracoid.
pl. Palatine.
pi. Pubis-ischium.
pm. Præmaxillary.
po. Prootic.
po'. Pollex.
psp. Parasphenoid.
pt. Pterygoid.
qj. Quadratojugal.
sc. Scapula.
sq. Squamosal.
ssc. Suprascapula.
st. Sternum.
sv. Sacral vertebra.
sy. Symphysial.
tf. Tibia-fibula.
v. Dorsal vertebræ.
vo. Vomer.
VI. Rudiment of sixth toe.

Series A. **FIRMISTERNIA.**

Family I. RANIDÆ.

Upper jaw toothed; diapophyses of sacral vertebra not or but very slightly dilated.

This family embraces 22 genera, of which 8 are represented in India and its dependencies.

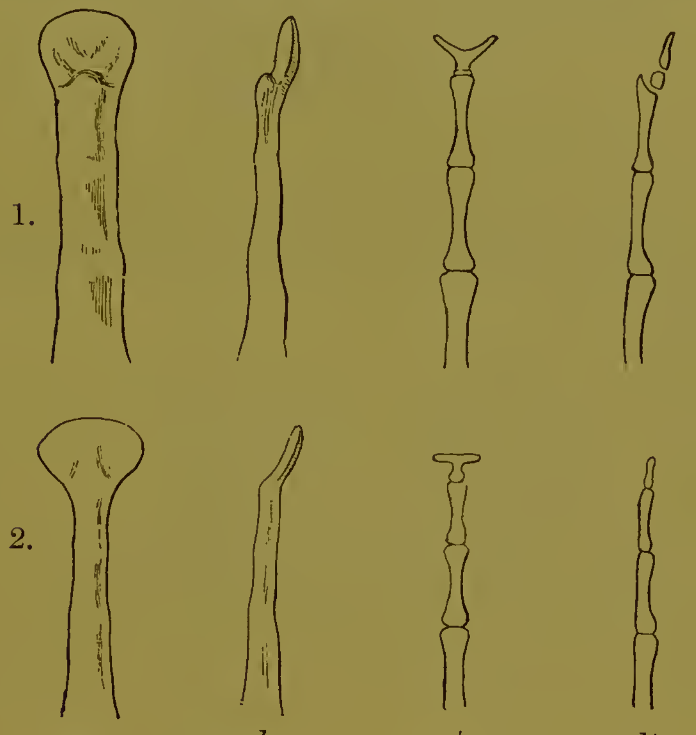

Fig. 128.—1. Finger of *Rhacophorus maximus*. 2. Finger of *Rana latopalmata*. (P. Z. S. 1888, p. 206.)
a. Upper view. *b*. Side view. *a'*, *b'*. Skeleton.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. No intercalary ossification between the distal and penultimate phalanges; extremity of penultimate phalanx not sharply defined externally (fig. 128, 2); digits perfectly free.
- *a*. Tongue entire; vomerine teeth none; toes largely webbed. . . . . Oxyglossus, p. 436.
- *b*. Tongue more or less deeply emarginate or bifid posteriorly.
  - *a'*. Toes webbed; outer metatarsals separated by web.
    - *a''*. Vomerine teeth; pupil horizontal. Rana, p. 438.

b''. No vomerine teeth .... MICRIXALUS, p. 464.
c''. Vomerine teeth; pupil vertical . NYCTIBATRACHUS, p. 467.
b'. Toes free; outer metatarsals bound together or separated by a groove.
a''. Pupil vertical .... NANNOBATRACHUS, p. 468.
b''. Pupil horizontal .... NANNOPHRYS, p. 469.
B. An intercalary ossification between the distal and penultimate phalanges; extremity of penultimate phalanx well indicated externally (fig. 128, 1).
a. Vomerine teeth .... RHACOPHORUS, p. 470.
b. No vomerine teeth .... IXALUS, p. 481.

Genus **OXYGLOSSUS**,

Tschudi, Class. Batr. p. 85, 1838.

Pupil horizontal. Tongue narrow, entire and free behind. Vomerine teeth none. Tympanum indistinct. Fingers free; toes webbed, the tips not dilated into regular disks. Outer metatarsal separated by web. Omosternum with a bony style; sternum a cartilaginous plate.

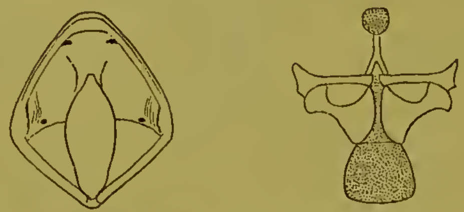

Fig. 129.—*Oxyglossus lima*. Open mouth and pectoral arch.

Distribution. Southern China and Burma to the Malay Archipelago.

Three species are known, of small size and thoroughly aquatic.

Synopsis of Indian and Burmese Species.

Tongue pointed behind .... *O. lima*, p. 436.
Tongue rounded behind.......................... *O. lævis*, p. 437.

1. Oxyglossus lima.

Rana lima, *Gravenh. Delic. Mus. Zool. Vratisl.* p. 41.
Oxyglossus lima, *Tschudi, Class. Batr.* p. 85; *Günth. Rept. B. I.* p. 401; *Bouleng. Cat. Batr. Sal.* p. 5.

Tongue elongate, extensively free and pointed behind. Habit stout. Head small; snout short, rather pointed, without canthus rostralis; interorbital space very narrow, much narrower than the upper eyelid. Fingers rather slender, acutely pointed, first not extending beyond second; toes pointed, fourth not very much longer than third and fifth, broadly webbed; subarticular tubercles

very small; two subconical metatarsal tubercles, inner largest; a short tarsal fold and a small tarsal tubercle just below the tibio-tarsal articulation. When the hind limb is stretched forwards along the body, the tarso-metatarsal articulation reaches the tip of the snout. Skin warty, the warts most numerous and of unequal sizes on back, largest and forming more or less symmetrical rows on the throat and belly. Greenish brown above, with small darker markings; sometimes a light vertebral stripe; whitish below, with a dark brown band beneath the arm and along the hinder side of the thigh, and a brown L-shaped mark on each side at the base of the thighs; sometimes a brown band on each side from the chin to the breast. Male with an internal subgular vocal sac.

From snout to vent 1·2 inches.

Hab. Lower Bengal, Burma, Southern China, Cochinchina, Camboja, Siam, Malay Peninsula, Java.

2. Oxyglossus lævis.

Oxyglossus lævis, *Günth. Cat. Batr. Sal.* p. 7, pl. i, fig. A; *Bouleng. Cat. Batr. Sal.* p. 6.

Tongue oval, rounded behind, free in its posterior third. Head small; snout rounded, without canthus rostralis; interorbital space narrower than the upper eyelid. Fingers short, with blunt tips, first not or but slightly extending beyond second; toes entirely webbed, the web more emarginate than in *O. lima*, the tips dilated into very small disks; subarticular tubercles small; inner metatarsal tubercle elliptical, compressed, larger in the female than in the male; outer metatarsal tubercle absent or very indistinct; a short tarsal fold. The tarso-metatarsal articulation reaches the end of the snout, or somewhat beyond. Skin smooth, or with small smooth warts. Brownish above, with or without rather indistinct darker spots; sometimes a light vertebral line; a light streak from the eye to the commissure of the mouth is often conspicuous; hind limbs with rather irregular dark cross bands; lower parts whitish, throat speckled with brown. Male with an internal subgular vocal sac.

In the Philippines this species reaches a length of 2 inches from snout to vent; the largest Burmese specimen examined by me measures 1·25 inches.

Hab. Burma, Malay Peninsula, Sumatra, Philippine Islands. In Burma this and the preceding species occur together in pools along streams.

A fossil species of this genus, *Oxyglossus pusillus* (*Rana pusilla*, Owen), has been recorded by Stoliczka, Mem. Geol. Surv. Ind. vi. pt. iii. p. 387, from the Lower Eocene Frog-beds of Bombay.

Genus RANA,

Linn. Syst. Nat. i, p. 354 (part.), 1766.

Pupil horizontal. Tongue free and deeply notched or bifid behind. Vomerine teeth. Tympanum usually distinct, sometimes hidden. Fingers free; toes webbed, with simple or dilated tips. Outer metatarsals separated by web. Omosternum and sternum with a bony style.

Fig. 130.—Open mouth of *Rana macrodon*.

Distribution. Cosmopolitan, except in the southern parts of South America, in Australia and New Zealand. Some 140 species are known, 41 of which occur within the limits of this fauna. All Indian species are probably aquatic during the breeding-season; otherwise their habits vary greatly according to the species, which may be aquatic, terrestrial, burrowing, or to a certain extent arboreal. Burrowing habits are indicated by the great development of the inner metatarsal tubercle, which is sharp-edged, and acts as a shovel, as in *R. breviceps*; this character is accompanied by an abbreviation of the hind limbs, which gives the frog a toad-like appearance. Arboreal habits are usually to be recognized by the distal enlargement of the digits, although some strictly aquatic forms, such as *R. kuhlii*, have the toes ending in small, but very distinct disks.

I have failed to recognize the following species, the descriptions of which are insufficient:—

1. *Rana sanguineo-maculata*, Lesson, in Bélang. Voy. Ind. Or., Zool. p. 328, pl. v. fig. 2.—Bengal.
2. *Rana newera-ellia*, Kelaart, Prodr. Faun. Zeyl. p. 192.—Ceylon.
3. *Limnodytes mutabilis*, Kelaart, op. cit. ii, p. 19.—Colombo.
4. *Limnodytes maculata*, Kelaart, l. c.—Galle, Ceylon.
5. *Limnodytes lividus*, Blyth, J. A. S. B. xxiii, 1854, p. 299.—Colombo, Ceylon.
6. *Limnodytes nigrovittatus*, Blyth, J. A. S. B. xxiv, 1855, p. 718.—Tenasserim.
7. *Rana altilabris*, Blyth, ibid, p. 720.—Pegu.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. No glandular lateral fold (except in *R. liebigii*, characterized by hidden tympanum); digital expansions, if present, much smaller than tympanum.
  a. Toes acutely pointed, very broadly webbed, 4th not very much longer than 3rd or 5th; inner metatarsal tubercle conical.
    a′. First finger extending a little beyond 2nd; tympanum as large as eye .... *R. hexadactyla*, p. 441.
    b′. First finger not extending beyond 2nd; tympanum usually smaller than eye.. *R. cyanophlyctis*, p. 442.
  b. Toes blunt or dilated at tips; no free papilla on middle of tongue.
    a′. Tympanum indistinct or hidden.
      a″. Lower jaw with a pair of tooth-like bony prominences in front; no copulatory excrescences in male.
        α. Toes webbed to extreme tips.
          α′. First finger not extending quite as far as 2nd; skin of back with transverse plaits .... *R. corrugata*, p. 443.
          β′. First finger extending as far as 2nd, or a little beyond ...... *R. kuhlii*, p. 443.
        β. Toes not webbed to tips.
          α′. Vomerine teeth in 2 oblique series; skin verrucose........ *R. laticeps*, p. 444.
          β′. Vomerine teeth in 2 transverse series; skin perfectly smooth.. *R. khasiana*, p. 444.
      b″. No tooth-like prominences in lower jaw; breeding-male with copulatory excrescences on fore limbs and breast.
        α′. A glandular dorso-lateral fold; tibio-tarsal articulation reaching tip of snout, or beyond .... *R. liebigii*, p. 445.
        β′. No glandular lateral fold; tibio-tarsal articulation hardly reaching eye .... *R. sternosignata*, p. 445.
    b′. Tympanum perfectly distinct.
      a″. Toes more than half webbed.
        α. Vomerine teeth commencing on a line with hinder edge of choanæ.
          α′. Tibio-tarsal articulation not reaching end of snout; head much broader than long...... *R. feæ*, p. 446.
          β′. Tibio-tarsal articulation reaching end of snout; head longer than broad .... *R. andersonii*, p. 447.
          γ′. Tibio-tarsal articulation not reaching end of snout; head as long as broad .... *R. doriæ*, p. 447.
        β. Vomerine teeth in two strong oblique series commencing from inner anterior corner of choanæ.
          α′. Skin smooth above, or with small

rounded warts; toes with distinctly swollen tips........ *R. macrodon*, p. 448.

β'. Skin very warty above; tibio-tarsal articulation reaching end of snout........................ *R. verrucosa*, p. 448.

γ'. Skin of back with longitudinal folds. *R. tigrina*, p. 449.

b''. Toes not more than half webbed.

. Inner metatarsal tubercle shorter than inner toe; belly smooth.

a'. Inner metatarsal tubercle not more than half length of inner toe.. *R. limnocharis*, p. 450.

β'. Inner metatarsal tubercle more than half length of inner toe.. *R. rufescens*, p. 451.

β. Inner metatarsal tubercle very large, compressed, longer than inner toe; belly granulate.

a'. First finger extending much beyond 2nd; tympanum about half size of eye.............. *R. breviceps*, p. 451.

β'. First finger extending much beyond 2nd; tympanum at least two thirds size of eye; toes hardly one-third webbed .... *R. dobsonii*, p. 452.

γ'. First and second fingers equal; tympanum as large as eye .... *R. strachani*, p. 452.

c. Toes dilated into very distinct disks; a free conical papilla on middle of tongue.

a'. Toes at least half webbed.

a''. First finger not extending as far as 2nd .... *R. leithii*, p. 453.

b''. First finger extending slightly beyond 2nd.

a'. Toes two-thirds webbed; tympanum two-thirds diameter of eye *R. beddomii*, p. 453.

β'. Toes half-webbed; tympanum as large as eye.................. *R. semipalmata*, p. 454.

b'. Toes one-third or one-fourth webbed; 1st finger not extending quite so far as 2nd.

a''. Head nearly smooth; back with short glandular folds; no lumbar spot .. *R. leptodactyla*, p. 454.

b''. Head nearly smooth; back with short glandular folds; a black lumbar spot. *R. diplosticta*, p. 455.

c''. Upper surfaces very warty .... *R. phrynoderma*, p. 455.

B. A glandular fold along each side of back; tympanum very distinct; digits more or less distinctly dilated at end.

a. Toes not or hardly two-thirds webbed.

a'. An outer metatarsal tubercle (at base of fourth toe).

a''. Skin smooth above; tibio-tarsal articulation reaching tip of snout, or beyond.

a. Foot at least as long as distance between tympanum and vent.... *R. macrodactyla*, p. 455.

β. Foot shorter than distance between tympanum and vent............ *R. gracilis*, p. 456.

b″. Skin granulate above.
α. Tibio-tarsal articulation not reaching beyond eye .... *R. malabarica*, p. 456.
β. Tibio-tarsal articulation reaching tip of snout, or beyond .... *R. nicobariensis*, p. 459.
b′. No outer metatarsal tubercle .... *R. lateralis*, p. 457.
b. Web reaching terminal disks of 3rd and 5th toes.
a′. Tympanum at least two thirds size of eye.
a″. An outer metatarsal tubercle (at base of fourth toe).
α. Tibio-tarsal articulation not reaching beyond eye; 1st finger extending beyond 2nd; head large .... *R. curtipes*, p. 458.
β. Tibio-tarsal articulation reaching beyond eye.
α′. First finger not extending beyond 2nd .... *R. tytleri*, p. 458.
β′. First finger extending beyond 2nd. *R. temporalis*, p. 459.
b″. No outer metatarsal tubercle.
α. Vomerine teeth very feebly developed; limbs with dark cross bands........................ *R. margariana*, p. 459.
β. Vomerine teeth well developed; no dark cross bands on limbs.
α′. First finger extending beyond 2nd. *R. humeralis*, p. 460.
β′. First finger not extending beyond 2nd........................ *R. erythræa*, p. 460.
b′. Tympanum about one third size of eye. . *R. monticola*, p. 461.
No glandular lateral fold; digits dilated into large disks which at least equal tympanum in size.
a. Third finger not longer than distance between nostril and tympanum.
a′. First finger extending a little beyond 2nd; tympanum about half diameter of eye. *R. livida*, p. 462.
b′. First finger not extending quite as far as 2nd; tympanum not half diameter of the eye .... *R. latopalmata*, p. 462.
b. Third finger at least as long as distance between tip of snout and tympanum; 1st finger much shorter than 2nd.
a′. Tibio-tarsal articulation reaching beyond tip of snout; tibia as long as trunk. . *R. himalayana*, p. 463.
b′. Tibio-tarsal articulation reaching tip of snout; tibia considerably shorter than trunk .... *R. formosa*, p. 463.

3. Rana hexadactyla.

Rana hexadactyla, *Lesson, in Bélang. Voy. Ind. Or., Zool.* p. 331; *Günth. Rept. B. I.* p. 405; *Bouleng. Cat. Bat. Sal.* p. 17.
Dactylethra bengalensis, *Lesson, Ill. Zool.* pl. xlvii.
Rana cutipora, *Dum. & Bibr. Erp. Gén.* viii, p. 338.
Rana robusta, *Blyth, J. A. S. B.* xxiii, 1854, p. 298.

Vomerine teeth in two oblique series extending beyond the hinder edge of the choanæ. Head moderate; snout rather pointed; canthus rostralis indistinct; interorbital space much narrower than the upper eyelid; tympanum distinct, as large as the eye. Fingers slender, acutely pointed, first extending a little beyond second; toes webbed to the tips, which are acutely pointed; outer toe strongly fringed; fourth toe not very much longer than third or fifth; subarticular tubercles of fingers and toes very small; inner metatarsal tubercle small, conical; no outer tubercle. When the hind limb is carried forwards along the body, the tibio-tarsal articulation reaches the eye. Skin smooth, with more or less distinct rows of pores round the neck, sides, and belly. Brown above; sometimes a light vertebral line; two blackish streaks on the hinder side of the thighs, sometimes indistinct. Young beautifully striped. Male with two external vocal vesicles opening by two slits beneath the angles of the mouth.

From snout to vent 5 inches.

Hab. Southern India and Ceylon *. Thoroughly aquatic.

4. Rana cyanophlyctis.

Rana cyanophlyctis, *Schneid. Hist. Amph.* i, p. 137; *Günth. Rept. B. I.* p. 406; *Bouleng. Cat. Batr. Sal.* p. 17; *Murray, Zool. Sind*, p. 398.
Rana bengalensis, *Gray, Ill. Ind. Zool.* i, pl. lxxxii, fig. 2; *Kelaart, Prodr.* p. 192.
Rana leschenaultii, *Dum. & Bibr. Erp. Gén.* viii, p. 342; *Cantor, J. A. S. B.* xvi, 1847, p. 1059.
Dicroglossus adolfi, *Günth. P. Z. S.* 1860, p. 158, pl. xxviii, fig. B; *id. Rept. B. I.* p. 402.

Vomerine teeth in two small oblique series extending a little beyond the hinder edge of the choanæ. Head moderate; snout scarcely pointed; canthus rostralis indistinct; interorbital space much narrower than the upper eyelid; tympanum distinct, about two thirds the size of the eye. Fingers slender, pointed, first not extending beyond second; toes webbed to the tips, which are pointed, fourth not much longer than third or fifth; outer toe strongly fringed; subarticular tubercles small; inner metatarsal tubercle small, conical, much like a rudimentary toe. The tibio-tarsal articulation usually reaches a little beyond the eye. Skin with small tubercles and warts above, and with more or less distinct rows of pores. Brown or olive above, dark spotted or marbled; two blackish streaks on the hinder side of the thighs, seldom absent; beneath often speckled with blackish. Male with two external vocal vesicles, opening by two slits beneath the angles of the mouth.

From snout to vent $2\frac{1}{2}$ inches.

Hab. Widely distributed and common from South Arabia and

* The reference of a Nepal frog to this species in the Cat. Batr. Sal. p. 17, is the result of an error; the specimen belongs to *R. cyanophlyctis*.

Baluchistan to the Malay peninsula, and from the Himalayas (up to 6000 feet) to Ceylon. Like the larger *R. hexadactyla*, this species is thoroughly aquatic and bears resemblance, in general form, to *Oxyglossus*. It is not unfrequently found in pools of brackish water.

5. Rana corrugata.

Rana corrugata, *Peters, MB. Ak. Berl.* 1863, p. 412; *Bouleng. Cat. Batr. Sal.* p. 19.
Rana kuhlii, part., *Günth. Rept. B. I.* p. 404, pl. xxvi, fig. B.

Vomerine teeth in two very small oblique groups behind the level of the choanæ; lower jaw with a pair of tooth-like prominences in front. Head moderate, snout short, rounded, without canthus rostralis; upper eyelid very narrow; eyes prominent, turned upwards; tympanum hidden. Fingers short, blunt, first not extending quite so far as second; toes short, ending in small disks, webbed to the extreme tips; subarticular tubercles small; a narrow, feebly prominent, inner metatarsal tubercle, about half the length of the inner toe; no outer tubercle; a tarsal fold. Hind limbs very stout; the tibio-tarsal articulation reaches the ear or the posterior border of the eye. Skin of back with transverse plaits. Brown above, uniform or darker spotted, with or without a pale vertebral band; a light cross band between the eyes. Male without vocal sacs.

From snout to vent $2\frac{1}{2}$ inches.

Hab. Ceylon.

6. Rana kuhlii.

Rana kuhlii, *Dum. & Bibr. Erp. Gén.* viii, p. 384; *Günth. Rept. B. I.* p. 404; *Bouleng. Cat. Batr. Sal.* p. 20.

Vomerine teeth in two small oblique series behind the choanæ; lower jaw with two more or less developed tooth-like prominences in front. Head moderate in the female, enormously large in the full-grown male; snout short, without canthus rostralis; eyes prominent, turned upwards; interorbital space as broad as, or broader than, the upper eyelid; tympanum hidden. Fingers moderate, blunt, first and second equal, or first extending a little beyond second; toes broadly webbed, fourth only $\frac{1}{5}$ longer than the fifth, the tips dilated into small disks; subarticular tubercles well developed; inner metatarsal tubercle narrow, blunt, about three fifths the length of the inner toe; no outer tubercle; a tarsal fold. The tibio-tarsal articulation reaches the ear or the eye. Above with short longitudinal glandular folds or roundish tubercles, sometimes nearly smooth, except upon the tibia. Brown above, with a rather indistinct light cross band between the eyes; sometimes a light vertebral band. Male without vocal sac.

From snout to vent 3 inches.

Hab. Southern China, Burma, Malay Archipelago.

7. Rana laticeps.

Rana laticeps, *Bouleng. Cat. Batr. Sal.* p. 20, pl. i, fig. 1.

Vomerine teeth in two oblique oval groups behind the level of the hinder edge of the choanæ; lower jaw with two bony prominences in front, acute and directed backwards in the adult male. Head large, triangular, especially in the adult male; snout short, subacuminate, with rounded canthus rostralis; interorbital space broader than the upper eyelid; tympanum scarcely distinct, two thirds the size of the eye. Fingers moderate, blunt, first not extending beyond second; toes moderate, nearly entirely webbed, the tips dilated into very small disks; a tarsal fold; subarticular tubercles well developed; inner metatarsal tubercle elongate, blunt, two thirds the length of the inner toe; no outer tubercle. Tibiotarsal articulation reaching to between the eye and the end of the snout. Upper parts with small elongated warts and rounded tubercles; a fold above the tympanum. Brown above, indistinctly marbled with darker; a light dark-edged cross band between the upper eyelids; legs indistinctly cross-barred; throat spotted with brown. Male without vocal sacs.

From snout to vent 2 inches.

Hab. Khási Hills; recently obtained at Malacca.

8. Rana khasiana.

Pyxicephalus khasianus, *Anders. J. A. S. B.* xl, 1871, p. 23.
Rana khasiana, *Bouleng. Cat. Batr. Sal.* p. 34.

"Body short and thick, legs of moderate length. Head short and broad. Snout short and rounded; no canthus rostralis; nostrils directed upwards and backwards, almost on the upper surface and halfway between the eye and the snout. Eyes rather large and prominent. Occiput much swollen. Tympanum invested by the skin, but faintly visible, small, one half the diameter of the eye. Skin in the groin full, smooth throughout, no trace of tubercles; fingers quite free; three small tubercles on the palmar aspect, the inner one the largest, elongated and simulating the shovel-like tubercle of the metatarsus. The first and second fingers of nearly equal length, about half shorter than the third; the fourth about one third shorter than the third. Thighs rather short, lower leg little shorter than the thigh. Tarsus and foot the length of the thigh and one half of the tibial portion. The body very little longer than the distance between the vent and the heel. The shovel-shaped (metatarsal) prominence laterally compressed, but not prominent. Two apophyses on the lower jaw. The choanæ are round, more distinctly defined, but rather smaller, than the eustachian tubes; vomerine prominences placed transversely behind the choanæ and separated from each other by a narrow interval. Tongue rather small, cordate and notched behind. Uniform brown above, faintly barred on the thigh; spotted with brown on the sides, chin, thorax, and under surface of limbs." (*Anderson.*)

Hab. Khási Hills.

9. Rana liebigii.

Megalophrys gigas, *Blyth, J. A. S. B.* xxiii, 1854, p. 299 (*nec* Rana gigas, *Laur.*).
Rana liebigii, *Günth. P. Z. S.* 1860, p. 157, pl. xxviii, fig. A ; *id. Rept. B. I.* p. 407 ; *Bouleng. Cat. Batr. Sal.* p. 21.
Rana sikimensis, *Jerdon, P. A. S. B.* 1870, p. 83.
Rana gammii, *Anders. J. A. S. B.* xl, 1871, p. 21.
? Rana vicina, *Stoliczka, P. A. S. B.* 1872, p. 130.

Vomerine teeth in two small oblique groups extending a little beyond the hinder edge of the choanæ. Head moderate, much depressed; snout very short, rounded; canthus rostralis indistinct; interorbital space nearly as broad as the upper eyelid; tympanum rather small, hidden. Fingers moderate, first not extending beyond second; toes moderate, truncated or slightly swollen at the end, entirely webbed; no tarsal fold; subarticular tubercles not much

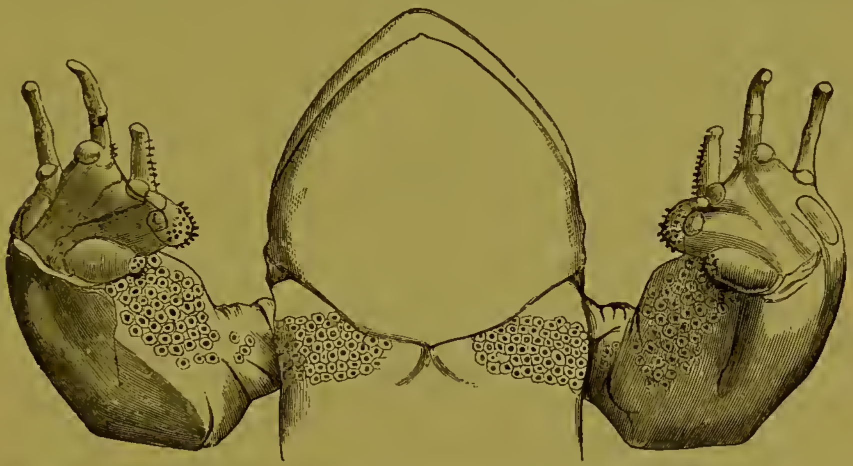

Fig. 131.—Nuptial excrescences of *Rana liebigii.* (Cat. Batr. Sal. B. M.)

developed; inner metatarsal tubercle oval, not very prominent; no outer tubercle. The tibio-tarsal articulation reaches the tip of the snout, or beyond. Skin smooth above, seldom warty; a strong fold above the tympanum; a narrow glandular fold on each side of the back. Brown above; a black line on the canthus rostralis and on the temporal region; lateral folds black-margined; legs indistinctly cross-barred. Male with internal vocal sacs; during the breeding-season remarkable on account of the extreme thickness of the arms and of the patches of spinose warts on the breast, the inner side of the arms, and the inner fingers.

From snout to vent 5 inches.

Hab. Himalayas, between 4000 and 10,000 feet. Common in Sikhim.

10. Rana sternosignata.

Rana sternosignata, *Murray, A. M. N. H.* (5) xvi, 1885, p. 120.

Vomerine teeth in two small oblique groups extending beyond

the hinder edge of the choanæ. Habit stout. Head much broader than long; snout very short, broadly rounded; no canthus rostralis; nostril a little nearer to the eye than to the end of the snout; interorbital space narrower than the upper eyelid; tympanum rather indistinct, about half the diameter of the eye. Fingers moderate, first not extending beyond second; toes slightly swollen at the end, entirely webbed; a very feeble tarsal fold; subarticular tubercles not much developed; inner metatarsal tubercle oval, not prominent, not quite half the length of the inner toe; no outer tubercle. The tibio-tarsal articulation hardly reaches the eye; tibia not measuring half the distance from snout to vent. Upper surfaces smooth or with small warts; sides warty. Olive-brown above, uniform or freckled with darker; limbs without transverse bands; lower parts whitish, throat and limbs mottled with brown. Male with internal vocal sacs; breeding-male with the arms very much thickened, and with black asperities on the breast and on the two inner fingers.

From snout to vent 3·3 inches.

Hab. Malir near Karáchi, Sind; Zandra and Quetta, Baluchistan.

11. Rana feæ.

Rana feæ, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 418, pl. iii.

Vomerine teeth in two small oblique groups extending beyond the hinder edge of the choanæ. Habit stout. Head much broader than long; snout very short, broadly rounded; no canthus rostralis; nostril a little nearer to the eye than to the end of the snout; interorbital space narrower than the upper eyelid; tympanum distinct, three fifths the diameter of the eye. Fingers moderate, first extending beyond second; toes rather short, entirely webbed; subarticular tubercles moderate; tips of fingers and toes obtuse; inner metatarsal tubercle narrow, elongate, three fifths the length of the inner toe; no outer tubercle; a narrow fold along the inner edge of the tarsus. The tibio-tarsal articulation reaches the eye; tibia measuring half the distance from snout to vent. Sides of body warty, large elongate smooth warts being intermixed with small round ones; posterior part of upper eyelid warty; a fold from the eye to the shoulder. Olive-brown above, with rather indistinct darker spots and a blackish, white-edged ocellus at the hip-joint; interrupted cross bands on the limbs; lower parts dirty white. Male with internal vocal sacs; arms, during the breeding-season, extremely thickened; a patch of black spines on each side of the breast and others on the inner metacarpal tubercle and the inner side of the two inner fingers; the arrangement of these nuptial excrescences very similar to that in *R. liebigii*, in which species, however, they are also present on the inner side of the arms.

From snout to vent 3·5 inches.

Hab. Kakhyen Hills.

12. Rana andersonii.

Polypedates yunnanensis, *Anders. An. Zool. Res. Yunnan,* p. 843, pl. lxxviii, fig. 3 (nec *Rana yunnanensis,* ejusd.).
Rana andersonii, *Bouleng. Cat. Batr. Sal.* p. 55.

Vomerine teeth in two small, slightly oblique groups on a line with the posterior border of the choanæ. Head moderate; snout moderate, rounded, with obtuse canthus rostralis and subvertical concave lores; nostril equally distant from the eye and the end of the snout; interorbital space a little broader than the upper eyelid; tympanum very distinct, half the diameter of the eye. Fingers moderate, first not extending beyond second; toes moderate, nearly entirely webbed; tips of fingers and toes dilated into very small disks; subarticular tubercles rather small; a single, small, inner metatarsal tubercle; no tarsal fold. Tibio-tarsal articulation reaching beyond the tip of the snout; tibia more than half the length of the head and body. Flat warts on the sides of the body; a fold above the tympanum. Olive above, spotted with black; limbs with numerous black cross bands; beneath white, immaculate. Male with two internal vocal sacs.

From snout to vent 3·75 inches.

Hab. Hotha Valley, Yunnan (5000 feet); Kakhyen Hills.

13. Rana doriæ.

Rana doriæ, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 482, pl. viii, fig. 1.

Vomerine teeth in two oblique oval groups commencing on a line with the hinder edge of the choanæ; lower jaw without bony prominences. Head moderate; snout short, obtuse, about as long as the diameter of the orbit; canthus rostralis obtuse; loreal region slightly concave; nostril equally distant from the orbit and the end of the snout; interorbital space as broad as the upper eyelid; tympanum distinct, two thirds or three fourths the diameter of the eye. Fingers moderate, first extending a little beyond second; toes moderate, nearly entirely webbed; a feeble cutaneous fringe along the outer side of the fifth toe; tips of fingers and toes dilated into small disks; subarticular tubercles moderate; inner metatarsal tubercle elongate, blunt, two thirds the length of the inner toe; no outer tubercle; a feeble tarsal fold. The tibio-tarsal articulation reaches the eye or the nostril. Skin smooth, or with irregular glandules on the back; a more or less distinct transverse fold connects the posterior borders of the eyes; a strong fold from the eye to the shoulder, above the tympanum. Brown above, with small irregular darker spots; sometimes a yellowish vertebral band; a lighter cross band between the eyes, bordered with darker behind; lips with vertical dark brown bars; hind limbs with rather irregular darker cross bands;

lower surfaces white, uniform or scantily spotted with brown. Male without vocal sacs.

From snout to vent 2·2 inches.

Hab. Tenasserim.

14. Rana macrodon.

Rana macrodon, *Dum. & Bibr. Erp. Gén.* viii, p. 382; *Bouleng. Cat. Batr. Sal.* p. 24, pl. i, fig. 4.
Rana fusca, *Blyth, J. A. S. B.* xxiv, 1855, p. 719.

Vomerine teeth in two strong oblique series commencing from the inner anterior corner of the choanæ; lower jaw with two fang-like bony prominences in front, sometimes scarcely developed. Head large; snout rather pointed; occiput more or less swollen on the sides; interorbital space generally one half broader than the upper eyelid; tympanum distinct, variable in size, generally much smaller than the eye. Fingers moderate, obtuse, first much longer than second; toes broadly webbed, with distinctly swollen tips; subarticular tubercles well developed; inner metatarsal tubercle elongate, blunt, about three fifths the length of the inner toe; no outer tubercle; a feeble tarsal fold. The tibio-tarsal articulation reaches the eye or a little beyond. Skin smooth above, or with small rounded warts; upper eyelid tubercular; a strong fold above the tympanum. Brown or blackish above; sometimes a light vertebral band. Male without vocal sacs.

From snout to vent 6 inches.

Hab. Upper Burma, Tenasserim, Malay Peninsula and Archipelago.

15. Rana verrucosa.

Rana verrucosa, *Günth. P. Z. S.* 1875, p. 567; *Bouleng. Cat. Batr. Sal.* p. 29, pl. iv. fig. 1.

Vomerine teeth in two strong oblique series commencing from the inner anterior corners of the choanæ. Head moderate; snout rather pointed; interorbital space two thirds the width of the upper eyelid; tympanum distinct, three fourths the diameter of the eye. Fingers moderate, obtuse, first extending much beyond second; toes moderate, obtuse, nearly entirely webbed; subarticular tubercles very prominent; inner metatarsal tubercle oval, compressed, hardly half as long as the first toe; a small, rounded, outer metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout. Upper parts with numerous very prominent warts and short glandular folds. Grey or brown above, darker spotted; hinder side of thighs black, white-marbled; sometimes a broad light vertebral band. Male with two internal vocal sacs.

From snout to vent 2·75 inches.

Hab. Malabar.

16. Rana tigrina.

Rana tigrina, *Daud. Hist. Rain.* p. 64, pl. xx; *Kelaart, Prodr.* p. 192; *Günth. Rept. B. I.* p. 407; *Bouleng. Cat. Batr. Sal.* p. 26; *Murray, Zool. Sind,* p. 398.
Rana brama, *Lesson, in Bélang. Voy. Ind. Or., Zool.* p. 329, pl. vi.
Rana malabarica (*non D. & B.*), *Kelaart, Prodr.* p. 191.
Rana crassa, *Jerdon, J. A. S. B.* xxii, 1853, p. 531.
Hoplobatrachus ceylanicus, *Günth. Rept. B. I.* p. 410.

Vomerine teeth in two strong oblique series commencing from the inner anterior angle of the choanæ; lower jaw with two not very prominent bony processes in front. Head moderate; snout

Fig. 132. – *Rana tigrina.*

more or less pointed; canthus rostralis obtuse; nostril a little nearer to the end of the snout than to the eye; interorbital space narrower than the upper eyelid; tympanum distinct, about two thirds the size of the eye. Fingers rather short, first extending beyond second; toes moderate, obtuse, nearly entirely webbed; a

much developed membranaceous fringe along the fifth toe; subarticular tubercles moderate; inner metatarsal tubercle very variable, small and blunt, or (var. *ceylanica*, Ceylon and S. India) nearly as long as the inner toe, strongly compressed, crescentic, shovel-shaped; no outer tubercle; a tarsal fold. Tibio-tarsal articulation reaching the ear, the eye, or a little beyond. Skin of back with longitudinal folds; a strong fold above the tympanum. Green or olive above, with dark spots; often a light vertebral line. Male with two subgular vocal sacs, conspicuous externally by folds of the skin on the sides of the throat; these regions generally blackish.

From snout to vent 6·5 inches.

Hab. All over India and Ceylon to the Indus and the base of the Himalayas, and from China to the Malay Peninsula and Archipelago.

The largest Indian Frog. It is essentially aquatic, and is said, when frightened, to jump over the surface of the water much in the same way as on land *.

17. Rana limnocharis.

Rana limnocharis, *Wiegm. N. Acta Ac. Leop.-Carol.* xvii, 1835, p. 255.
Rana gracilis (*non Gravh.*), *Wiegm. l. c.* p. 257; *Günth. Rept. B. I.* p. 409; *Bouleng. Cat. Batr. Sal.* p. 28.
? Rana assimilis, *Blyth, J. A. S. B.* xxi, 1852, p. 355.
Rana agricola *and* R. nilagirica, *Jerdon, J. A. S. B.* xxii, 1853, p. 532.
Rana gracilis, vars. andamanensis, nicobariensis, pulla, *Stoliczka, J. A. S. B.* xxxix, 1870, p. 142.
Rana brevipalmata, *Peters, MB. Ak. Berl.* 1871, p. 646.

Very closely allied to *R. tigrina*, from which it differs in its smaller size, half-webbed toes, slight development of the fringe on the fifth toe, and usually in the presence of a small outer metatarsal tubercle. The length and shape of the snout, the size of the inner metatarsal tubercle, and the relative length of the hind limbs and of the fourth toe vary to an extraordinary degree. The tibio-tarsal articulation usually reaches the eye, or between the latter and the end of the snout; but in some specimens (var. *brevipalmata*, from Pegu and S. India) it reaches considerably beyond the end of the snout, and the foot measures two thirds the distance between the end of the snout and the vent. Greenish or olive, with darker spots; a light vertebral line or band frequently present; sometimes a light line along the inner side of the leg; sides of thighs black-marbled; throat of male usually with two large black blotches, sometimes connected and forming a **M**.

From snout to vent 2·5 inches.

* The species that is so well known by this habit in India has never been accurately determined. It is, however, a smaller species than *R. tigrina* and is I think, *R. cyanophlyctis*. Probably *R. hexadactyla* has the same habit.—W. T. B.

Hab. A widely distributed species, extending from China and Southern Japan, throughout India, Ceylon, and Burma to the Malay Peninsula and Archipelago. In the Himalayas (Sikhim) it occurs up to 7000 feet. Stoliczka observes that it usually does not hesitate to take to the sea or brackish water.

18. Rana rufescens.

Pyxicephalus rufescens, *Jerdon, J. A. S. B.* xxii, 1853, p. 534; *Günth Rept. B. I.* p. 412.
Rana rufescens, *Bouleng. Cat. Batr. Sal.* p. 29.

Vomerine teeth in two oblique groups extending a little beyond the hinder edge of the choanæ. Head short; snout rounded, with obtuse canthus rostralis; interorbital space half as broad as the upper eyelid; tympanum distinct, about half the diameter of the eye. Fingers moderate, first extending much beyond second, nearly as long as third; toes rather elongate, not quite half webbed; subarticular tubercles moderate; inner metatarsal tubercle large, compressed, shovel-shaped, about two thirds the length of the inner toe; a small outer metatarsal tubercle. The tibio-tarsal articulation reaches the tympanum or the eye. Skin of the upper parts with large, rounded, very prominent warts. Greyish brown above, indistinctly marbled; legs transversely barred; throat brown-spotted, with a Λ-shaped black patch in the male. The latter with two external subgular vocal sacs.

From snout to vent 1·4 inches.

Hab. Malabar.

19. Rana breviceps.

Rana breviceps, *Schneid. Hist. Amph.* i, p. 140; *Bouleng. Cat. Batr. Sal.* p. 32.
Rana variegata, *Gravenh. Delic. Mus. Vratisl.* p. 33, pl. viii, fig. 1.
Pyxicephalus fodiens *and* P. pluvialis, *Jerdon, J. A. S. B.* xxii, 1853, p. 534.
Sphærotheca strigata, *Günth. Cat. Batr. Sal.* p. 20, pl. ii, fig. A.
Pyxicephalus breviceps, *Günth. Rept. B. I.* p. 411; *Murray, Zool. Sind*, p. 399.

Vomerine teeth in two oblique groups extending a little beyond the hinder edge of the choanæ. Habit stout. Head short; snout rounded; occiput swollen; interorbital space narrower than the upper eyelid; tympanum distinct, about two thirds the diameter of the eye. Fingers moderate, obtuse, first extending much beyond second, nearly as long as third; toes moderate, obtuse, half webbed; subarticular tubercles moderate; inner metatarsal tubercle very large, sharp-edged, shovel-shaped, longer than the inner toe; no outer tubercle; no tarsal fold. Hind limbs short, the tibio-tarsal articulation reaching the axilla or the tympanum. Skin smooth above, or granulate, with some scattered tubercles or short, interrupted longitudinal folds; a strong fold from the eye to the shoulder; belly and lower surfaces of thighs granulate.

Light brown or olive above, with darker spots or marblings; often a light vertebral band, and sometimes another on the upper side of each flank; throat of males blackish, of females usually brown-spotted. Male with two much-developed internal subgular vocal sacs.

From snout to vent 2·5 inches.

Hab. From the Punjab and Sind to Southern India and Ceylon. In the Himalayas up to about 7000 feet. The structure of the hind limbs enables this frog to burrow in the ground for about 1½ feet.

20. **Rana dobsonii.**

Rana dobsonii, *Bouleng. Cat. Batr. Sal.* p. 32, pl. iii, fig. 1.

Vomerine teeth in two oblique series between the choanæ. Habit stout. Head large; snout short, rounded, with obtuse canthus rostralis; interorbital space narrower than the upper eyelid; tympanum very distinct, three fourths the diameter of the eye. Fingers moderate, obtuse, first much longer than second, as long as third; toes webbed at the base, moderate; subarticular tubercles large; inner metatarsal tubercle very large, sharp-edged, shovel-shaped, longer than the inner toe; no outer tubercle; no tarsal fold. Tibio-tarsal articulation reaching the shoulder or the tympanum. Skin smooth above, granular on the belly and under the thighs; a fold from the eye to the shoulder. Greyish or purplish above, indistinctly marbled with brown, sometimes with a fine light vertebral line; a deep black streak from the end of the snout, through the nostril and the eye, to the shoulder, expanding in a round spot on the tympanum; thighs black above, whitish marbled; beneath yellowish, throat brown-spotted.

From snout to vent 2·3 inches.

Hab. Mangalore, South Canara.

21. **Rana strachani.**

Tomopterna strachani, *Murray, Zool. Sind,* p. 399.

Apparently allied to the two preceding species. "Muzzle very little longer than broad. Snout obtuse. Tympanum distinct, circular, as large as the eye. Crown flattish. Lower jaw with weak bony prominences. Skin of the back with short longitudinal folds; a fold on each side of the abdomen, and another across the under surface of the body, immediately behind the fore limbs. A plait behind the tympanum coming down to the shoulder. Fingers quite free, swollen at the tips; laid beside each other, the first, second, and fourth fingers are of equal length. Hind limb longer than the head and body; laid beside the body, the metatarsal tubercle reaches the end of the snout. Metatarsus with a sharp-edged spur on the inner side and a tubercle on the outer. Toes half-webbed, the tips slightly swollen, and each of the joints on the under surface with a tubercle. Third toe slightly longer than

the fifth, fourth the longest. Colour greyish, with a rufescent tinge. A dark brown subtriangular spot on the occiput, extending from across and behind the eyelids, immediately following which is a filiform white vertebral streak, extending to the vent; back with six irregular-shaped dark brown spots. Plait behind the tympanum reddish brown. Fore and hind limbs externally with transverse bars of the same colour. Upper and lower jaws with vertical bars of reddish brown. Chin, throat, and rest of under surface white." (*Murray.*)

Hab. Malir, near Karáchi, Sind.

22. Rana leithii.

Rana leithii, *Bouleng. A. M. N. H.* (6) ii, 1888, p. 506.

Vomerine teeth in two oblique groups just behind the level of the choanæ. A free, pointed papilla on the middle of the tongue. Head moderate; snout obtuse, with obtuse canthus rostralis and concave loreal region; nostril nearer to the end of the snout than to the eye; interorbital space a little narrower than the upper eyelid; tympanum distinct, two thirds the diameter of the eye. Fingers moderate, first not extending quite as far as second; toes two-thirds webbed, the web reaching the disks of the third and fifth toes; tips of fingers and toes dilated into small but well-developed disks; subarticular tubercles moderate; a single, small, oval inner metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches halfway between the eye and the end of the snout. Skin of back with small scattered longitudinal warts; a strong fold from the eye to the shoulder. Brown above, with small dark spots; limbs with dark transverse bands; lower parts white, throat mottled with brown.

From snout to vent 1·25 inches.

Hab. Matheran, Bombay.

23. Rana beddomii.

Polypedates beddomii, *Günth. P. Z. S.* 1875, p. 571, pl. lxiii, fig. B.
Polypedates brachytarsus, *Günth. l. c.* p. 572.
Rana beddomii, *Bouleng. Cat. Batr. Sal.* p. 55.

Vomerine teeth in two oblique groups just behind the level of the choanæ. A free, pointed papilla on the middle of the tongue. Head moderate; snout obtuse, with obtuse canthus rostralis and concave loreal region; nostril a little nearer to the end of the snout than to the eye; interorbital space as broad as the upper eyelid, or a little narrower; tympanum distinct, two thirds the diameter of the eye. Fingers moderate, first extending slightly beyond second; toes two-thirds webbed, the web reaching the disks of the third and fifth toes; tips of fingers and toes dilated into well-developed disks; subarticular tubercles well developed; a single, small, oval inner metatarsal tubercle; no tarsal fold. The tibio-tarsal arti-

culation reaches the tip of the snout or a little beyond. Skin of back with short longitudinal glandular folds; a strong fold from the eye to the shoulder. Brown above, with rather indistinct darker spots; rarely uniform pinkish; sometimes a light vertebral band; a dark cross band between the eyes; a black band along the canthus rostralis and a black temporal spot; limbs more or less distinctly cross-barred; lower parts uniform whitish. Male without vocal sacs.

From snout to vent 2·5 inches.

Hab. Forests of Southern India.

24. **Rana semipalmata.**

Rana semipalmata, *Bouleng. Cat. Batr. Sal.* p. 56, pl. iv, fig. 3.

Intermediate between *R. beddomii* and *R. leptodactyla*. Distinguished from both by the much larger tympanum, which about equals the eye; from the former, by the toes, which are only half webbed; from the latter, by the length of the first finger, which exceeds that of the second, and by the more extensive web between the toes.

From snout to vent 1·4 inches.

Hab. Malabar.

25. **Rana leptodactyla.**

Polypedates brevipalmatus, *Günth. P. Z. S.* 1875, p. 572.
Rana leptodactyla, *Bouleng. Cat. Batr. Sal.* p. 57.

Vomerine teeth in two oblique groups just behind the level of the choanæ. A free, pointed papilla on the middle of the tongue. Head moderate, rather depressed; snout blunt, with moderate canthus rostralis; interorbital space as broad as, or a little narrower than, the upper eyelid; tympanum distinct, half the diameter of the eye. Fingers moderate, first not extending as far as second; toes one-third or one-fourth webbed; tips of fingers and toes dilated into small but well-developed disks; subarticular tubercles well developed; a small, oval, inner metatarsal tubercle; no tarsal fold. Tibio-tarsal articulation reaching the tip of the snout or beyond. Skin of the back with short longitudinal glandular folds; a fold from the eye to the shoulder. Olive or brownish above, mottled with darker; a more or less distinct subtriangular dark spot between the eyes, often limited in front by a light cross band; sometimes a light vertebral band; a black band along the canthus rostralis, and a black temporal spot; limbs cross-barred; beneath, immaculate or spotted with brown, sometimes brown dotted with white.

From snout to vent 1·3 inches.

Hab. Forests of Malabar; Anaimalais.

26. Rana diplosticta.

Ixalus diplostictus, *Günth. P. Z. S.* 1875, p. 574, pl. lxiii, fig. C.
Rana diplostictus, *Bouleng. Cat. Batr. Sal.* p. 58.

Very closely allied to, and perhaps not different from, the preceding species. The canthus rostralis is rather more angular and the loreal region not quite so oblique. A black spot above the loin on each side.

Hab. Malabar.

27. Rana phrynoderma.

Rana phrynoderma, *Bouleng. Cat. Batr. Sal.* p. 462.

Vomerine teeth in two slightly oblique oval groups between the choanæ. A free, pointed papilla on the middle of the tongue. Head moderate; snout short, rounded, with indistinct canthus rostralis and concave loreal region; nostril equally distant from the eye and the tip of the snout; interorbital space narrower than the upper eyelid; tympanum moderately distinct, about two thirds the diameter of the eye. Fingers and toes rather short, the tips dilated into small but well-developed disks; first finger not extending as far as second; toes one-fourth webbed; subarticular tubercles well developed; a single, small, oval inner metatarsal tubercle; a slight tarsal fold. The tibio-tarsal articulation reaches the tip of the snout. Upper parts covered with strong warts of different sizes and short glandular folds; a strong fold from the eye to the shoulder. Dark greyish brown above, with obsolete darker spots; limbs with regular cross bars; beneath brown, dotted with whitish.

From snout to vent 1·3 inches.

Hab. Anaimalai Hills.

28. Rana macrodactyla.

Hylarana macrodactyla, *Günth. Cat. Batr. Sal.* p. 72, pl. ii, fig. C; *id. Rept. B. I.* p. 424.
Rana macrodactyla, *Bouleng. Cat. Batr. Sal.* p. 54.
? Hylorana subcœrulea, *Cope, Proc. Ac. Philad.* 1868, p. 140.

Vomerine teeth in two oblique series between the choanæ. Head depressed, longer than broad; snout long, subacuminate; loreal region nearly vertical, concave; nostril much nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum very distinct, nearly as large as the eye. Fingers slender, elongate, first not extending beyond second; foot nearly as long as the distance between the vent and the tympanum; toes very slender, half webbed; tips of fingers and toes dilated into very small disks; subarticular tubercles moderate; a small oval inner, and a small rounded outer metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches the tip of the

snout or beyond. Skin smooth; a narrow glandular lateral fold. Brown above, usually with darker spots; sides dark brown, or closely spotted with dark brown; upper lip and lateral fold whitish; usually a light vertebral line; limbs with transverse dark brown spots, which do not range across, being interrupted on the upper surface; one or two dark brown lines along the back of the thighs; lower surfaces white.

From snout to vent 1·5 inches.

Hab. Burma and Southern China.

29. **Rana gracilis.**

Rana gracilis, *Gravenh. Delic. Mus. Zool. Vratisl.* p. 45, pl. viii, fig. 3.
Lymnodytes macularius, *Blyth, J. A. S. B.* xxiii, 1854, p. 299.
Hylorana macularia, *Günth. Rept. B. I.* p. 425, pl. xxvi, fig. C.
Rana macularia, *Bouleng. Cat. Batr. Sal.* p. 60.

Vomerine teeth in two oblique groups between the choanæ. Head depressed, longer than broad; snout long, subacuminate, prominent; loreal region nearly vertical, concave; nostril much nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum very distinct, nearly as large as the eye. Fingers slender, first extending beyond second; toes slender, rather more than half webbed; tips of fingers and toes slightly swollen, or dilated into very small disks; subarticular tubercles well developed; inner metatarsal tubercle small, oval; a rather large outer tubercle; no tarsal fold. The tibio-tarsal articulation reaches the nostril or the tip of the snout. Skin smooth; a rather broad glandular lateral fold; a short glandular fold from beneath the eye to the shoulder, followed by a series of more or less confluent glandules, simulating a second glandular fold. Brown above, sides of head and body darker; some dark spots on the middle of the back, sometimes confluent into a vertebral band; upper lip and lower glandular fold white, hinder side of thighs marbled blackish and white; beneath white, immaculate or brown-spotted on the throat. Male with two not much developed external vocal sacs below the angle of the mouth.

From snout to vent 2·5 inches.

Hab. Ceylon.

30. **Rana malabarica.**

Rana malabarica, *Dum. & Bibr. Erp. Gén.* viii, p. 365, pl. lxxxvi, fig. 1; *Bouleng. Cat. Batr. Sal.* p. 60.
Hylorana malabarica, *Günth. Rept. B. I.* p. 426.

Vomerine teeth in two oval oblique groups between the choanæ. Head moderate, depressed; snout moderate, hardly as long as the diameter of the orbit, subacuminate, moderately prominent; loreal

region concave; nostril nearer to the end of the snout than to the eye; interorbital space rather narrower than the upper eyelid; tympanum very distinct, nearly as large as the eye. Fingers moderate, first extending beyond second; toes rather short, half webbed; tips of fingers and toes swollen; subarticular tubercles very strong; inner metatarsal tubercle oval, blunt; a large rounded tubercle at the base of the fourth toe; no tarsal fold. The tibio-tarsal articulation reaches the tympanum or the eye. Skin finely granulate above; a broad, not very prominent glandular lateral fold; a strong glandular fold from below the eye to the shoulder, followed by one or two glandules. Head and body bright crimson above, blackish brown on the sides; back sometimes with a few small black spots; upper lip, and a series of spots on the flank, white; limbs blackish brown above, spotted and marbled with pale brown and white; beneath uniform white, or marbled brown and white.

From snout to vent 2·75 inches.

Hab. Malabar and Bombay hills (Matheran).

31. **Rana lateralis.**

Rana lateralis, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 483, pl. viii, fig. 2.

Vomerine teeth in two oblique series between the choanæ, and extending to the inner anterior corner of the latter, widely separated from each other. Head moderate, depressed; snout as long as the diameter of the orbit, acuminate, slightly projecting; nostril equally distant from the orbit and the end of the snout; loreal region concave; interorbital space as broad as the upper eyelid; tympanum very distinct, three fourths the diameter of the eye. Fingers moderate, first much longer than second; toes three-fifths webbed; tips of fingers and toes slightly swollen; subarticular tubercles small; a large, compressed, very prominent inner metatarsal tubercle, two thirds the length of the inner toe; no outer metatarsal tubercle. The tibio-tarsal articulation reaches the anterior border of the eye. Skin smooth; a narrow glandular lateral fold and another from below the eye to above the shoulder. Back grey, sides black, the two colours sharply separated on the lateral fold and on the canthus rostralis; a black line borders the upper lip, separated from the black loreal and temporal regions by a broad pure white band which extends to above the shoulder and sends up a process behind the tympanum; a grey band along each flank, separated from the belly by an irregular black band; a black humeral spot; hind limbs with black cross bars; hinder sides of thighs marbled black and white; a black band along the anterior side of the thighs; throat blackish, with a whitish median line; breast closely spotted with black; belly white. Male with internal vocal sacs.

From snout to vent 2·1 inches.

Hab. Tenasserim (Kokarit, east of Moulmein).

32. Rana curtipes.

Rana curtipes, *Jerdon, J. A. S. B.* xxii, 1853, p. 532; *Bouleng. Cat. Batr. Sal.* p. 61.

Vomerine teeth scarcely developed, sometimes indistinct, in two slightly oblique series on a level with the hinder edge of the choanæ. Head large; snout short, rounded, with well-marked canthus rostralis and concave loreal region; nostril nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum distinct, nearly as large as the eye. Fingers moderate, first extending beyond second; toes short, nearly entirely webbed; tips of fingers and toes swollen or dilated into very small disks; subarticular tubercles much developed; inner metatarsal tubercle small, oval, blunt; a rather large, flat tubercle at the base of the fourth toe; no tarsal fold. The tibio-tarsal articulation reaches the eye. Skin finely granular above; a moderately prominent, rather narrow glandular lateral fold; another fold behind the tympanum down to the shoulder. Greyish or brown above, with or without blackish dots; lateral fold lighter, edged with black; a blackish oblique spot or band below the eye; upper lip with a blackish margin; limbs dark purplish brown, without cross bands; light brown beneath, the throat sometimes dark brown. Male with an internal subgular vocal sac.

From snout to vent 3·25 inches.

Hab. Forests of North Canara and Malabar.

33. Rana tytleri.

Hylorana tytleri, *Theob. Cat. Rept. As. Soc. Mus.* p. 84; *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 148, pl. ix, fig. 1.
Hylorana leptoglossa, *Cope, Proc. Ac. Philad.* 1868, p. 139.
Hylorana pipiens, *Jerdon, P. A. S. B.* 1870, p. 83.
? Hylorana granulosa, *Anders. J. A. S. B.* xl, 1871, p. 23.
Rana alticola *and* R. tytleri, *Bouleng. Cat. Batr. Sal.* pp. 62, 65.

Vomerine teeth in two oblique series between the choanæ. Head a little longer than broad; snout a little longer than the diameter of the orbit, more or less acuminate and prominent, with well-marked canthus rostralis and concave loreal region; nostril nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum very distinct, as large as the eye or a little smaller. Fingers rather slender, first not extending beyond second; toes moderate, nearly entirely webbed; tips of fingers and toes swollen into small but very distinct disks; subarticular tubercles well developed; inner metatarsal tubercle very small, scarcely prominent; a rather indistinct outer metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches the tip of the snout, or a little beyond. A slightly prominent, narrow glandular lateral fold; another, sometimes indistinct, from behind the tympanum to the shoulder. Light brown above, scarcely or not

spotted, sides dark brown; glandular fold whitish, black-margined; upper lip whitish with a dark margin; limbs with dark cross bands; whitish beneath, the throat and breast nearly covered with brown spots leaving a median line immaculate. Male with internal vocal sacs and an oval flat gland on the inner side of the arm.

From snout to vent 2 inches.

Hab. Dacca, Khási Hills, Burma.

34. Rana nicobariensis.

Hylorana nicobariensis, *Stoliczka, J. A. S. B.* xxxix, 1870, pt. 2, p. 150, pl. ix, fig. 2.
Rana nicobariensis, *Bouleng. A. M. N. H.* (5) xvi, 1885, p. 389.

Very closely allied to the preceding, but head longer, and toes barely two-thirds webbed. Skin of back granulate. Back usually spotted or marbled with blackish.

From snout to vent 2 inches.

Hab. Nicobars, Nias, Sumatra.

35. Rana temporalis.

? Rana flavescens, *Jerdon, J. A. S. B.* xxii, 1854, p. 531.
Hylorana temporalis, *Günth. Rept. B. I.* p. 427, pl. xxvi, fig. G.
Rana temporalis, *Bouleng. Cat. Batr. Sal.* p. 63.

Vomerine teeth in two oblique series extending beyond the level of the hinder edge of the choanæ. Head depressed, a little longer than broad; snout subacuminate, prominent, as long as the diameter of the orbit or slightly longer; canthus rostralis angular; loreal region nearly vertical, strongly concave; interorbital space as broad as the upper eyelid or rather broader; tympanum very distinct, as large as the eye or a little smaller. Fingers moderate, first extending beyond second; toes nearly entirely webbed; tips of fingers and toes dilated into well developed disks; subarticular tubercles well developed; inner metatarsal tubercle oval, blunt; a small round, outer metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches the nostril, the tip of the snout, or a little beyond. Skin smooth or finely granulate above; a narrow glandular lateral fold. Brown above; loreal and temporal regions, and sometimes also the sides of the body, dark brown; a white labial band; limbs with dark cross bands; lower parts white, throat and breast more or less speckled with brown. Male with internal vocal sacs and an oval flat gland on the inner side of the arm.

From snout to vent 3·2 inches.

Hab. Anaimalai Hills and Ceylon.

36. Rana margariana.

Hylarana margariana, *Anders. An. Zool. Res. Yunnan,* p. 846, pl. lxxviii, fig. 4.
Rana margariana, *Bouleng. Cat. Batr. Sal.* p. 58.

Vomerine teeth very feebly developed, in two oblique series between the choanæ. Head moderate, rather flat; canthus rostralis rounded, loreal region deeply concave; tympanum distinct, nearly as large as the eye. Fingers moderate, first slightly longer than second, with a rudimentary web (?); toes moderate, nearly entirely webbed; a small elongate inner metatarsal tubercle; disks of fingers very feebly developed, of toes more strongly so. A narrow glandular fold from behind the eye along the side of the body. Olive-brown above, with a dark almost blackish band from the snout through the eye, along the sides of the groin, and a narrow pale line from below the eye to the shoulder; limbs cross-barred; throat and chest almost black from the profusion of dark brown specks.

From snout to vent 1·6 inches.

Hab. Kakhyen Hills, Upper Burma.

37. Rana humeralis.

Rana humeralis, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 420, pl. iv, fig. 1.

Vomerine teeth in two oblique series between the choanæ, their outer extremities nearly touching the anterior corners of the latter. Head depressed, nearly as long as broad; snout long, obtusely acuminate and projecting; canthus rostralis obtuse; loreal region concave; nostril much nearer to the end of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum nearly as large as the eye. Fingers and toes as in *R. erythræa,* except that the first finger extends distinctly beyond the second, and the disks are a trifle less developed; inner metatarsal tubercle moderate, oval; no outer tubercle. The tibio-tarsal articulation reaches half-way between the eye and the end of the snout. Skin smooth; a glandular lateral fold, narrower than in *R. erythræa*; another fold from below the eye to the shoulder, followed by a prominent glandule. Grey-brown or pale olive above, greenish on the flanks; glandular dorsal folds not light-coloured; loreal and temporal regions usually darker; upper lip whitish; hinder side of thighs blackish, or marbled with blackish; no cross-bands on the limbs; lower surfaces white. Male with two external subgular vocal sacs, and a large oval gland on the arm.

From snout to vent 3·3 inches.

Hab. Bhámo, Teinzo, Upper Burma.

38. Rana erythræa.

Hyla erythræa, *Schleg. Abbild.* p. 27, pl. ix, fig. 3.
Limnodytes erythræus, *Dum. & Bibr. Erp. Gén.* viii, p. 511, pl. lxxxviii, fig. 1; *Cantor, J. A. S. B.* xvi, 1847, p. 1062.
Hylorana erythræa, *Günth. Rept. B. I.* p. 425.
Rana erythræa, *Bouleng. Cat. Batr. Sal.* p. 65.

Vomerine teeth in two oblique groups between the choanæ. Head depressed, a little longer than broad; snout long, obtusely

acuminate and projecting; canthus rostralis angular; loreal region concave; nostril much nearer to the end of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum very distinct, nearly as large as the eye. Fingers rather slender, first not extending beyond second; toes nearly entirely webbed; tips of fingers and toes dilated into small but well-developed disks; subarticular tubercles moderate; a small oval inner metatarsal tubercle; no outer tubercle; no tarsal fold. The tibio-tarsal articulation reaches the tip of the snout. Skin smooth; a rather broad and prominent glandular lateral fold; another fold from below the eye to the shoulder, followed by a strong glandule. Green above (brown or bluish in spirits); upper lip yellow; lateral fold yellow, margined with black beneath; tympanum reddish brown; hind limb dark speckled or longitudinally streaked; lower surfaces uniform white. Male with internal vocal sacs.

From snout to vent 2·6 inches.

Hab. Burma, Malay Peninsula and Archipelago.

39. Rana monticola.

Hylorana monticola, *Anders. J. A. S. B.* xl, 1871, p. 25.
? Hylarana pipiens (*non Jerd.*), *Stoliczka, P. A. S. B.* 1872, p. 106.

"Snout of moderate length, very little longer than the distance between the eyes, moderately pointed. Canthus rostralis triangular or nearly so. Loreal region between the nostril and eye flat, perpendicular and then abruptly rounded outwards to lower jaw. Nostril slightly below the canthus rostralis and nearer to the end of the snout than to the eye. Upper jaw not projecting much below the lower. Tympanum distinct, small, about one third the size of the eye. The vomerine ridges begin on a line with the anterior internal angle of the choanæ, in two oblique lines, increasing in size from the front, converging behind, but separated by a considerable interspace. A glandular fold along the side of the back, with a very indistinct one from the tympanum to the shoulder. A few enlarged glands behind the mouth, with a short fold meeting the one from the tympanum and ceasing behind the shoulder. From the vent to the heel is slightly in excess of the length of the body. The length of the foot is about half the length of the body. Disks large. The thumb is a little shorter than the second finger, which is about one fourth shorter than the fourth. The third finger is one third longer than the fourth. Toes broadly webbed, the membrane reaching to the disks of all except the fourth. Dark slate-colour above, obscurely marked with large darker spots. A deep bluish-black band from the nostril through the eye and tympanum, and along the sides on which it expands, and is obscurely spotted with darker. A pale bluish line from the eye along the glandular fold. Upper surface of legs greyish, obscurely banded and mottled with slaty brownish. Back of thighs finely reticulated with brown. Under surface yellowish. Upper lip, postoral glands and fold yellowish, faintly mottled with dark slaty. A narrow

slaty streak along the margin of the lower jaw. A dark bluish-black broken band from the angle of the mouth downwards and backwards along the fore part of the humerus, separated from the general dark slaty of the arm by a narrow yellowish streak. Below, the elbow and the hands barred with blackish."

Length of body 2·8 inches.

Hab. Darjeeling (3500 feet).

40. Rana livida.

? Polypedates smaragdinus, *Blyth, J. A. S. B.* xxi, 1852, p. 355.
Polypedates lividus, *Blyth, J. A. S. B.* xxiv, 1855, p. 718.
Polypedates smaragdinus, *Jerdon, P. A. S. B.* 1870, p. 83.
Polypedates chloronotus, *Günth. P. Z. S.* 1875, p. 569, pl. lxv, fig. A.
Rana chloronota, *Bouleng. Cat. Batr. Sal.* p. 69.
Rana livida, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 484.

Vomerine teeth in two oblique series commencing between, and extending posteriorly beyond, the choanæ. Head much depressed, about as long as broad; snout shorter than the diameter of the orbit, rounded; canthus rostralis obtuse; loreal region nearly vertical, concave; nostril a little nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum distinct, about half the diameter of eye. Fingers moderate, depressed, first extending slightly beyond second; toes webbed to the disks; tips of fingers and toes dilated into very large disks, that of the third finger as large as the tympanum; subarticular tubercles large; a single, oval, inner metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches beyond the tip of the snout; tibia as long as the trunk. Skin smooth above; a glandular fold from below the eye to the shoulder, followed by a glandule. Upper surface of the head and body green, usually with a few black spots; sides of head, body, and limbs dark brown; limbs with blackish cross bands; groin and back of thighs with yellow spots or marblings; a white streak along the upper lip; beneath white or yellowish, the throat usually speckled with brown. Male with two external vocal sacs below the angles of the mouth.

From snout to vent 3·6 inches.

Hab. Darjeeling, mountains of Assam and Tenasserim, Hong Kong.

41. Rana latopalmata.

Polypedates ? marmoratus, *Blyth, J. A. S. B.* xxiv, 1855, p. 188.
Polypedates afghana, *Günth. Cat. Batr. Sal.* p. 81; *id. Rept. B. I.* p. 432.
? Ixalus kakhienensis, *Anders. Zool. Res. Yunnan,* p. 845, pl. lxxviii, fig. 6.
Rana afghana, *Bouleng. Cat. Batr. Sal.* p. 69.
Rana latopalmata, *Bouleng. l. c.* p. 464.

Vomerine teeth in two short, straight or slightly oblique series behind the level of the choanæ. Head much depressed, as long as broad or a little broader than long; snout shorter than the diameter of the orbit, rounded; canthus rostralis obtuse; loreal region con-

cave; nostril a little nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum small, often rather indistinct, not more than two fifths the diameter of the eye. Fingers moderate, depressed, first not extending quite as far as second; toes webbed to the disks; tips of fingers and toes dilated into very large disks, that of the third finger larger than the tympanum; subarticular tubercles large; inner metatarsal tubercle oval, flat; outer metatarsal tubercle very indistinct or absent; no tarsal fold. The tibio-tarsal articulation reaches beyond the tip of the snout; tibia as long as the trunk. Skin smooth or granulate above; sides with larger glandules; a fold above the tympanum; belly granular. Brown or dark olive above, spotted or marbled with darker, or with greyish variegations; limbs with dark cross bands; beneath yellowish, uniform or marbled with brown. Male with internal vocal sacs.

From snout to vent 3·5 inches.

Hab. Eastern Himalayas (between 1000 and 3000 feet), Khási Hills, Kakhyen Hills (3500 feet), Pegu and Tenasserim (not Afghanistan).

42. Rana himalayana.

Rana himalayana, *Bouleng. A. M. N. H.* (6) ii, 1888, p. 507.

Vomerine teeth in two oblique series, forming a very open angle, on a level with the posterior border of the choanæ, which are unusually small. Head much depressed, broader than long; snout short, rounded; canthus rostralis obtuse; loreal region concave; nostril a little nearer to the eye than to the tip of the snout; interorbital space as broad as the upper eyelid; tympanum not or but slightly distinct, hardly one third the diameter of the eye. Fingers very long, dilated into very large disks, which measure more than half the diameter of the eye; inner finger with a small distal expansion, as long as the second minus the distal disk; third finger at least as long as the distance between the end of the snout and the tympanum. Toes moderate, much depressed, webbed to the disks, which are smaller than those of the fingers; subarticular tubercles large; an oval, flat, inner metatarsal tubercle; no outer tubercle; no tarsal fold. Tibio-tarsal articulation reaching beyond the tip of the snout; tibia as long as the trunk. Skin smooth above, with small granules on the sides and temples; no lateral fold; a rather feeble supratemporal fold; belly and proximal under surface of thighs granulate. Olive or greyish above, with rather indistinct large, round, darker spots on the body and cross bands on the limbs; hinder side of thighs purplish brown; lower surfaces brownish or pale olive. Male with internal vocal sacs.

From snout to vent 3 inches.

Hab. Darjeeling.

43. Rana formosa.

Polypedates formosus, *Günth. P. Z. S.* 1875, p. 570, pl. lxv, fig. B.
Rana formosa, *Bouleng. Cat. Batr. Sal.* p. 70.

Vomerine teeth in two small oblique series behind the level of the choanæ, which are very small. Head much depressed, broader than long; snout shorter than the diameter of the orbit, rounded; canthus rostralis obtuse; loreal region concave; nostril a little nearer to the eye than to the tip of the snout; interorbital space as broad as the upper eyelid; tympanum moderately distinct, about one third the diameter of the eye. Fingers very long, third at least as long as the distance between the end of the snout and the tympanum; first finger considerably shorter than second, dilated into a small disk; disks of the other fingers very large; toes webbed to the disks, which are smaller than those of the fingers; subarticular tubercles moderate; an oval, flat inner metatarsal tubercle; no tarsal fold. Tibio-tarsal articulation reaching the tip of the snout; tibia shorter than the trunk. Skin smooth above; belly granular. Green above, with blackish spots on the back and cross bands on the limbs; hinder side of thighs marbled with black; lower parts and web between the toes marbled brown and whitish. Male with internal vocal sacs.

From snout to vent 2·6 inches.

Hab. Khási Hills and Darjeeling.

Genus **MICRIXALUS**,

Boulenger, P. Z. S. 1888, p. 205.

Pupil horizontal. Tongue free and bifid behind. Vomerine teeth none. Tympanum indistinct or hidden. Fingers free, toes webbed, the tips dilated into regular disks. Outer metatarsals separated by web. Omosternum and sternum with a bony style. Digits with the normal number of phalanges, the distal phalanx T-shaped.

Distribution. Southern India and Ceylon.

Dwarfed forms of *Rana*, which do not develop vomerine teeth.

Synopsis of the Species.

A. No glandular dorso-lateral fold; digital disks very large, twice as wide as the non-dilated part; toes webbed to disks; tongue with a free, pointed papilla on median line.
  a. Belly smooth .... *M. saxicola*, p. 465.
  b. Belly coarsely granular.............. *M. sarasinorum*, p. 465.

B. A glandular dorso-lateral fold; digital disks moderate; toes incompletely webbed, web not reaching disk of fourth toe.
  a. Toes at least three-fourths webbed; tongue with a free, pointed papilla on the median line .... *M. opisthorhodus*, p. 465.
  b. Toes at least three-fourths webbed; no lingual papilla .... *M. fuscus*, p. 466.
  c. Toes not half webbed; no lingual papilla *M. silvaticus*, p. 466.

44. Micrixalus saxicola.

Polypedates? saxicola, *Jerdon, J. A. S. B.* xxii, 1853, p. 533.
Ixalus saxicola, *Bouleng. Cat. Batr. Sal.* p. 97.

Tongue with a free, pointed papilla in the anterior part of the median line. Snout subacuminate, as long as the diameter of the orbit; canthus rostralis angular; loreal region flat, vertical; nostril equally distant from the eye and the tip of the snout; interorbital space as broad as the upper eyelid; tympanum small, hidden. Toes very broadly webbed, the web reaching the disks, which are very large; subarticular tubercles small; a small inner metatarsal tubercle. The hind limb being stretched forwards along the body, the tibio-tarsal articulation reaches the tip of the snout or somewhat beyond. Skin smooth above and beneath; a fold from the eye to the shoulder. Olive-brown above, with more or less distinct darker reticulations; limbs with dark cross bands; throat and breast often marbled with brown. Male with internal vocal sacs, the openings of which are very small.

From snout to vent 1·2 inches.

Hab. Malabar and Wynaad; on rocks in shady mountain-streams.

45. Micrixalus sarasinorum.

Ixalus sarasinorum, *F. Müller, Verh. nat. Ges. Basel*, viii, 1887, p. 256, pl. i, fig. 1.

Tongue with a free, pointed papilla in the anterior part of the median line. Snout obtusely pointed, somewhat shorter than the diameter of the orbit; canthus rostralis scarcely marked; loreal region oblique, somewhat concave; nostril much nearer to the end of the snout than to the eye; interorbital space a little narrower than the upper eyelid; tympanum indistinct. Toes very broadly webbed, the web reaching the disks, which are large; subarticular tubercles small; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout. Skin above finely corrugated, with warts on the snout, vertex, flanks, and especially on the upper eyelids; a fold from the eye to the shoulder; a fine ridge along the middle of the head and back; belly granular. Olive-green above; a vertical white bar below the eye; a white lumbar spot; limbs with numerous dark cross bands; throat and belly dirty white.

Hab. Ceylon (Peradenia).

46. Micrixalus opisthorhodus.

? Limnodytes ? phyllophila, *Jerdon, J. A. S. B.* xxii, 1853, p. 532.
Ixalus opisthorhodus, *Günth. P. Z. S.* 1868, p. 484, pl. xxxvii, fig. 3; *Bouleng. Cat. Batr. Sal.* p. 95.

Tongue with a free, pointed papilla in the anterior part of the

median line. Snout subacuminate, prominent, about as long as the diameter of the orbit; canthus rostralis angular; loreal region flat, vertical; nostril nearly equally distant from the eye and the tip of the snout; interorbital space slightly broader than the upper eyelid; tympanum small, hidden. Toes about three-fourths webbed; disks moderate; subarticular tubercles small; a small inner metatarsal tubercle. Upper parts smooth, with a few short oblique glandular folds, and a narrow glandular lateral fold; a fold from the eye to the shoulder; lower parts quite smooth. Brownish above, with a few indistinct darker markings; loreal and temporal regions dark brown; limbs with dark cross bands; beneath immaculate, or brown-spotted on the throat and breast; lower surface of hind limbs, hinder side of thighs, and sometimes hind part of belly beautifully rose-coloured. Male with internal vocal sacs, the openings of which are very small.

From snout to vent 1·25 inches.

Hab. Forests of South-western India (Nilgiris, Malabar).

47. Micrixalus fuscus.

Ixalus fuscus, *Bouleng. Cat. Batr. Sal.* p. 96, pl. x, fig. 3.

Snout pointed, prominent, generally longer than the orbital diameter; canthus rostralis angular; loreal region flat, vertical; nostril halfway between the eye and the tip of the snout; interorbital space as broad as the upper eyelid; tympanum small, indistinct. Toes nearly entirely webbed; disks moderate; subarticular tubercles small; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches between the eye and the tip of the snout. Skin smooth above and beneath; a narrow glandular lateral fold; a fold from the eye to the shoulder. Brown or pinkish above; sides of head and body generally darker; limbs with dark cross bands; hinder side of thighs dark brown, with a more or less accentuated light median stripe; whitish beneath, marbled with brown. Male with two internal vocal sacs, the openings of which are very small.

From snout to vent 1·2 inches.

Hab. Forests, N. Canara to Travancore and Tinnevelly.

48. Micrixalus silvaticus.

Ixalus silvaticus, *Bouleng. Cat. Batr. Sal.* p. 469.

Snout rounded or subacuminate, slightly prominent, hardly as long as the diameter of the orbit; canthus rostralis angular; loreal region flat, vertical; nostril halfway between the eye and the tip of the snout; interorbital space a little broader than the upper eyelid; tympanum small, indistinct. Toes one-third or two-fifths webbed, the membrane extending as a narrow fringe along their sides; disks of fingers and toes small; subarticular tubercles small;

a small inner metatarsal tubercle. The tibio-tarsal articulation marks the posterior border or the centre of the eye. Skin smooth above and beneath; a narrow glandular lateral fold, commencing some distance from the eye; a fold from the eye to the shoulder. Brown above, with rather indistinct darker markings, the most constant being a broad chevron between the eyes; sides of head blackish brown; limbs cross-barred; hinder side of thighs blackish brown; groin and front of thighs frequently rose-coloured; brown beneath, throat and chest dotted, belly and lower surface of hind limbs marbled with whitish. Male with two internal vocal sacs.

From snout to vent 1·1 inches.

Hab. Malabar, in forests.

Genus **NYCTIBATRACHUS**,

Boulenger, Cat. Batr. Sal. p. 113, 1882.

Pupil vertical. Tongue free and deeply notched behind. Vomerine teeth. Tympanum hidden. Fingers free, toes webbed, the tips dilated into small disks. Outer metatarsals separated by web. Omosternum and sternum with a bony style. Phalanges normal, distal bifurcate.

Distribution. Southern India.

Synopsis of the Species.

Toes half webbed .... *N. pygmæus*, p. 467.
Toes almost entirely webbed..................... *N. major*, p. 468.

49. Nyctibatrachus pygmæus.

Rana pygmæa, *Günth. P. Z. S.* 1875, p. 568.
Nyctibatrachus pygmæus, *Bouleng. Cat. Batr. Sal.* p. 113, pl. xii, fig. 1.

Vomerine teeth in two small oblique series behind the level of the choanæ. Habit stout. Snout very short, without canthus rostralis; eyes very prominent, obliquely directed forwards and upwards; upper eyelid very narrow; interorbital space much broader than the upper eyelid. Fingers moderate, first shorter than second; toes moderate, half webbed, the tips swollen into very small disks; subarticular tubercles not much developed; a small, blunt, oval, inner metatarsal tubercle. The tarso-metatarsal articulation reaches the eye or slightly beyond. Skin smooth, with some glandular folds on the head and the front part of the back; a very distinct, oblique fold beneath the eye, and a vertical one on the tip of the snout. Dark brown above, with rather indistinct blackish markings; light brown beneath. Male without vocal sacs.

From snout to vent 1 inch.

Hab. Anaimalai Hills.

50. Nyctibatrachus major.

Nyctibatrachus major, *Bouleng. Cat. Batr. Sal.* p. 114, pl. xii, fig. 2.

Vomerine teeth in two straight series, oblique in the young, much behind the level of the choanæ. Habit stout. Snout very short, without canthus rostralis; eyes very prominent, obliquely directed forwards and upwards; upper eyelid very narrow; interorbital space twice as broad as the upper eyelid. Fingers moderate, first much shorter than second; toes moderate, nearly entirely webbed; tips of fingers and toes swollen into small disks; subarticular tubercles not much developed; a small, elongate, scarcely prominent, inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye, or somewhat beyond. Above with very thin, closely-set vermiculated folds; a rather indistinct oblique fold beneath the eye; upper eyelid covered with strong tubercles; throat with slight longitudinal folds. Brown above, with rather indistinct darker and lighter markings; brownish beneath, more or less speckled with brown. Male with two internal vocal sacs.

From snout to vent 2·2 inches.

Hab. Malabar; Wynaad.

Genus NANNOBATRACHUS,

Boulenger, Cat. Batr. Sal. p. 470, 1882.

Pupil vertical. Tongue free and nicked behind. Vomerine teeth. Tympanum hidden. Fingers and toes free, the tips dilated into small disks. Outer metatarsals separated by a groove. Omosternum and sternum slender, cartilaginous. Phalanges normal, distal bifurcate.

A single species, one of the smallest Batrachians known.

51. Nannobatrachus beddomii.

Nannobatrachus beddomii, *Bouleng. Cat. Batr. Sal.* p. 470.

Vomerine teeth in two oblique oval groups behind the level of the choanæ. Habit stout. Snout short, rounded, without canthus rostralis; upper eyelid narrow, much narrower than the interorbital space. Fingers moderate, first shorter than second; toes moderate, with a slight rudiment of web; disks and subarticular tubercles very small; a very indistinct inner metatarsal tubercle. The tarso-metatarsal articulation reaches the tip of the snout, or not quite so far. Skin quite smooth. Brown above, variegated with darker; generally a more or less distinct light band on each side of the back; limbs with dark cross bars; whitish beneath, immaculate.

From snout to vent 0·8 inch.

Hab. Tinnevelly Hills, S. India.

Genus NANNOPHRYS,

Günther, P. Z. S. 1868, p. 482.

Pupil horizontal. Tongue free and deeply nicked behind. Vomerine teeth. Tympanum more or less distinct. Fingers free, toes free, or with a rudiment of web, the tips not dilated. Outer metatarsals united. Omosternum cartilaginous; sternum a cartilaginous plate. Diapophyses of sacral vertebra slightly dilated. Phalanges normal.

Distribution. Ceylon.

Synopsis of the Species.

Tibio-tarsal articulation reaching the tympanum or eye .... *N. ceylonensis*, p. 469.
Tibio-tarsal articulation reaching tip of snout.... *N. guentheri*, p. 469.

52. Nannophrys ceylonensis.

Nannophrys ceylonensis, *Günth. P. Z. S.* 1868, p. 482, and 1875, p. 568; *Bouleng. Cat. Batr. Sal.* p. 115, pl. xii, fig. 3.
Trachycephalus ceylanicus, *Ferguson, A. M. N. H.* (4) xv, 1875, p. 128.

Vomerine teeth in two small groups close together behind the choanæ. Lower jaw with two slight prominences in front. Habit stout. Head broad; snout short, rounded, with angular canthus rostralis; interorbital space narrower than the upper eyelid; in the adult, the skin of the sides of the head and of the forehead becomes involved in the rough cranial ossification; tympanum about half the size of the eye. First finger shorter than second; the difference in length between the first and second fingers is the same as that between the second and third; subarticular tubercles of fingers and toes much developed; inner metatarsal tubercle elongate, rather indistinct; no outer tubercle. The tibio-tarsal articulation reaches the tympanum or the eye. Skin slightly tubercular above, smooth beneath; a fold of the skin uniting the posterior borders of the upper eyelids, and extending from the eye, over the tympanum, to the shoulder. Upper parts brown, marbled with darker; upper lip and sides of body and limbs with small light spots; hind limbs with dark cross bars; whitish beneath, the male's throat brown. Male with two internal vocal sacs.

From snout to vent 1·6 inches.

Hab. Ceylon.

53. Nannophrys guentheri.

Nannophrys guentheri, *Bouleng. Cat. Batr. Sal.* p. 115, pl. xii, fig. 4

Vomerine teeth in two indistinct groups behind the choanæ. Lower jaw with slight traces of bony prominences in front. Head rather small, without bony rugosities; snout short, rounded, with angular canthus rostralis; interorbital space narrower than the

upper eyelid; tympanum not distinctly defined. First finger shorter than second; the difference in length between the first and second finger is much greater than that between the second and third; tips of fingers pointed; toes with a short but very distinct web at the base; subarticular tubercles of fingers and toes not much developed; inner metatarsal tubercle elongate, rather indistinct; no outer tubercle. The tibio-tarsal articulation reaches the tip of the snout. Skin strongly tubercular above, smooth beneath; a fold of the skin uniting the posterior borders of the upper eyelids, and extending from the eye, over the tympanum, to the shoulder. Upper parts brown, marbled with darker; upper lip and sides of body and limbs with small light spots; hind limbs with dark cross bars; uniform whitish beneath. Male with two internal vocal sacs.

From snout to vent 1 inch.

Hab. Ceylon.

Genus **RHACOPHORUS**,

Kuhl, Isis, 1827, p. 294.

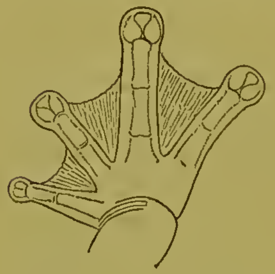

Fig. 133.—Hand of *Rhacophorus maximus.*

Pupil horizontal. Tongue free and deeply notched behind. Vomerine teeth. Tympanum usually distinct. Fingers usually more or less webbed; toes webbed; tips of fingers and toes dilated into regular disks. Outer metatarsals separated by web. Omosternum and sternum with a bony style. An intercalary ossification or additional phalanx between the penultimate and distal phalanges: latter usually bifurcate (see fig. 128, p. 435).

Distribution. Of the 42 known species, 20 are recorded from India and its dependencies, 6 from other parts of the Oriental region, 4 from China and Japan, and 12 from Madagascar. Habits scansorial.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Fingers more than half webbed.
  a. Vomerine teeth in two narrow transverse or oblique series touching inner front edge of choanæ; upper parts green (blue or purple in spirit), uniform or dotted with black.
    a'. Upper surfaces smooth; heel without dermal appendages; no spots .... *R. maximus*, p. 472.
    b'. Upper surfaces smooth; heel with a dermal appendage; one or two black spots on each side, behind the arm .... *R. bimaculatus*, [p. 472.

c'. Upper surfaces finely granulate; heel with a dermal appendage .... *R. malabaricus*, [p. 473.

b. Vomerine teeth in two oblique series between the choanæ.

a'. Upper surfaces with small warts, throat granulate .... *R. beddomii*, p. 473.

b'. Upper surfaces and throat smooth .... *R. lateralis*, p. 473.

c. Vomerine teeth in two widely separated small rounded groups, close to internal angle of choanæ .... *R. tuberculatus*, [p. 474.

B. Fingers not half webbed.

a. Tympanum more than half diameter of eye.

a'. Heel without dermal appendage.

a''. No parieto-squamosal arch; head usually rugose, with skin adhering to fronto-parietal bones .... *R. leucomystax*, [p. 474.

b''. A more or less distinct parieto-squamosal arch.

α. Skin of head free; disk of 3rd finger not more than half diameter of eye .. *R. maculatus*, [p. 475.

β. Skin adherent to nasal and frontoparietal bones; disk of 3rd finger at least half diameter of eye .... *R. cruciger*, p. 476.

b'. Heel with a dermal appendage.

a''. Snout not twice as long as diameter of eye. *R. eques*, p. 476.

b''. Snout twice as long as diameter of eye.. *R. nasutus*, p. 477.

b. Tympanum not more than half diameter of eye.

a'. Tongue with a free pointed papilla on median line.

a''. Diameter of eye equal to its distance from nostril, and twice diameter of tympanum .... *R. reticulatus*, [p. 477.

b''. Diameter of eye more than its distance from nostril, and more than twice diameter of tympanum.

α. Web scarcely developed between inner toes .... *R. dubius*, p. 477.

β. Web embracing at least half length of inner toes .... *R. nanus*, p. 8.

b'. Tongue without papilla.

a''. Fingers very distinctly webbed.

α. Tibio-tarsal articulation reaching posterior border of orbit; hinder side of thighs not coloured................ *R. jerdonii*, p. 478.

β. Tibio-tarsal articulation reaching centre of eye or beyond; hinder side of thighs brown, speckled with white .... *R. pleurostictus*, [p. 479.

b''. Fingers with a very slight rudiment of web.

α. Snout not longer than diameter of orbit; tympanum not half diameter of eye.

α'. Vomerine teeth in two oblique groups between choanæ .... *R. microtympanum*, [p. 479.

β'. Vomerine teeth in two small groups close to inner front corners of choanæ. *R. stictomerus*, [p. 480.

β. Snout longer than diameter of orbit; tympanum half diameter of eye.
 α′. Vomerine teeth in two small groups close to inner front corners of choanæ. *R. fergusonii*, [p. 480.
 β′. Vomerine teeth between choanæ; outer edge of arm and tarsus with a denticulate fringe .... *R. cavirostris*, [p. 481.

54. Rhacophorus maximus.

Rhacophorus maximus, *Günth. Cat. Batr. Sal.* p. 83; *id. Rept. B. I.* p. 435; *Bouleng. Cat. Batr. Sal.* p. 88, pl. ix, fig. 3.
Rhacophorus gigas, *Jerdon, P. A. S. B.* 1870, p. 84.

Vomerine teeth in two straight or slightly oblique series touching the inner front edge of the choanæ. Snout rounded, as long as the diameter of the orbit; canthus rostralis angular; loreal region concave; nostril halfway between the eye and the tip of the snout; interorbital space broader than the upper eyelid; tympanum about three fifths the diameter of the eye. Fingers nearly entirely webbed, the membrane reaching the disks of the fourth, and, on the outer side, of the third and second; distal expansions as large as the tympanum; toes webbed to the disks, which are smaller than those of the fingers; subarticular tubercles well developed. The tibio-tarsal articulation reaches the eye or the nostril. Skin smooth above, granular beneath; a fold above the tympanum. Green above (blue or violet in spirit), immaculate; sides of belly and hinder sides of thighs often dotted with purplish brown; a yellowish, brown-edged streak on the outer side of forearm and tarsus and transversely above the vent; white or pale brown beneath. Male with an internal vocal sac.

From snout to vent 4·5 inches.

Hab. Eastern Himalayas, Assam, and Khási Hills, between 1000 and 2000 feet. Lives near the watercourse of streams in very dense jungle.

55. Rhacophorus bimaculatus.

Rhacophorus reinwardtii (*non Kuhl*), *Jerdon, P. A. S. B.* 1870, p. 84.
Rhacophorus maculatus (*non Gray*), *Anders. J. A. S. B.* xl, 1871, p. 27.
Rhacophorus bimaculatus, *Bouleng. Cat. Batr. Sal.* p. 90.

Vomerine teeth in two oblique series touching the inner front edge of the choanæ. Snout rounded, as long as the diameter of the orbit; canthus rostralis obtuse; loreal region concave; nostril nearly halfway between the eye and the tip of the snout; interorbital space broader than the upper eyelid; tympanum half the diameter of the eye. Fingers nearly entirely webbed, the disks as large as the tympanum; toes webbed to the disks, which are smaller than those of the fingers; subarticular tubercles well developed. The tibio-tarsal articulation reaches the eye or the nostril. Skin smooth above, granular beneath; heel with a small triangular dermal process. Green above (purple or blue in spirit),

uniform or speckled with darker; humerus not coloured; only the outer finger and toe coloured; a large black spot on each side behind the arm, generally followed by a smaller one; lower parts white. Male with a subgular vocal sac.

From snout to vent 2·5 inches.

Hab. Khási Hills; Assam.

56. Rhacophorus malabaricus.

Rhacophorus malabaricus, *Jerdon, P. A. S. B.* 1870, p. 84; *Bouleng. Cat. Batr. Sal.* p. 90, fig.

Vomerine teeth in two straight or slightly oblique series touching the inner front edge of the choanæ. Snout subacuminate, as long as the diameter of the orbit; canthus rostralis obtuse; loreal region concave; nostril nearer the end of the snout than the eye; interorbital space broader than the upper eyelid; tympanum three fifths or two thirds the diameter of the orbit. Fingers and toes webbed to the disks, which equal the tympanum; subarticular tubercles well developed. The tibio-tarsal articulation reaches the eye or the nostril. Skin finely granular above, more coarsely beneath; granules under the thighs intermixed with larger ones; outer border of forearm and tarsus with a dermal fold; heel with a triangular dermal process. Green above (purple in spirit), often speckled all over with blackish; lower parts whitish.

From snout to vent 4 inches.

Hab. Malabar.

57. Rhacophorus beddomii.

Rhacophorus beddomii, *Bouleng. Cat. Batr. Sal.* p. 468.

Vomerine teeth in two oblique series between the choanæ, and extending backwards a little beyond them. Snout subtriangular; canthus rostralis distinct; loreal region slightly concave; nostril equally distant from the eye and the tip of the snout; interorbital space as broad as the upper eyelid; tympanum two fifths the diameter of the eye. Fingers and toes webbed to the disks, which are as large as the tympanum; subarticular tubercles moderate. The tibio-tarsal articulation reaches the anterior border of the eye. Upper surfaces with very small smooth tubercles; a fold from the eye to the shoulder; a slight fringe along the forearm and tarsus; beneath granular. Light reddish brown above, indistinctly variegated with grey; hind limbs rather indistinctly cross-barred with grey. Male with an internal vocal sac.

From snout to vent 1·9 inches.

Hab. Calcad Hills, Tinnevelly (3000 feet).

58. Rhacophorus lateralis.

Rhacophorus lateralis, *Bouleng. A. M. N. H.* (5) xii, 1883, p. 162.

Vomerine teeth in two small oblique series between the choanæ.

Snout rounded; canthus rostralis distinct; loreal region slightly concave; nostril nearer to the tip of the snout than to the eye interorbital space broader than the upper eyelid; tympanum half the diameter of the eye. The three outer fingers nearly entirely webbed; toes nearly entirely webbed; disks of fingers and toes smaller than the tympanum; subarticular tubercles not very prominent. The tibio-tarsal articulation reaches the tip of the snout. Skin smooth above, granular on the belly and under the thighs; a fold of the skin bordering the fore limb anteriorly. Purplish above (in spirit), white beneath; head and back with dark dots; coloured parts of limbs with dark cross lines; a white streak on each side, from the nostril along the outer edge of the upper eyelid to the groin; arm, the three inner fingers, and the four inner toes not coloured.

From snout to vent 1·25 inches.

Hab. Malabar. Known from a single young specimen.

59. Rhacophorus tuberculatus.

Polypedates tuberculatus, *Anders. J. A. S. B.* xl, 1871, p. 26.
Rhacophorus tuberculatus, *Bouleng. Cat. Batr. Sal.* p. 86.

"Head of moderate size; snout rounded and somewhat pointed. Canthus rostralis indistinct, rounded. Nostrils below it near the tip of the snout. Tympanum about two thirds the size of the eye; vomerine prominences close to the internal angle of the choanæ, rounded and small, with a large interspace between them. Fingers broadly webbed, the membrane reaching the disks of the second and fourth fingers. Disks of fingers large, about one third larger than those of the toes. A small oblong metatarsal tubercle. Length from the vent to the metatarsal tubercle considerably larger than the body. A strong fold from the eye over the tympanum to the shoulder. Skin smooth above. Abdomen finely granular, with numerous moderately-sized round tubercles; under surface of thighs granular, with scattered large round tubercles. Upper surface uniformly deep brown in spirit. Brownish yellow below with a blackish region round the vent, a short way along the thighs. The tubercles of the abdomen and thighs are darker. Faint black banding on the tibiæ and femora. Some specimens with a violet spot on the tip of the snout, another before the eye, and a broad violet band with dark margins from the eye along the side of the groin." (*Anderson.*)

From snout to vent 1·6 inches.

Hab. Sibságar, Assam.

60. Rhacophorus leucomystax.

Hyla leucomystax *and* H. sexvirgata, *Gravenh. Delic. Mus. Vratisl.* pp. 26, 28.
Hyla quadrilineata, *Wiegm. N. Acta Ac. Leop.-Carol.* xvii, i, 1835, p. 260, pl. xxii, fig. 1.

Polypedates leucomystax, *Tschudi, Class. Batr.* p. 75; *Cantor, J. A. S. B.* xvi, 1847, p. 1063.
Polypedates rugosus, *Dum. & Bibr. Erp. Gén.* viii, p. 520.
Polypedates maculatus, part., *and* P. quadrilineatus, *Günth. Cat. Batr. Sal.* pp. 78, 79; *id. Rept. B. I.* pp. 428, 429.
Rhacophorus maculatus, part., *Bouleng. Cat. Batr. Sal.* p. 83.
Rhacophorus leucomystax, *Bouleng. P. Z. S.* 1889, p. 29.

All the specimens from the Eastern Himalayas and the countries east of the Bay of Bengal differ from the Indian and Ceylonese (*R. maculatus* and *cruciger*) in the absence of a parieto-squamosal arch. Except in the Himalayan and some South Chinese examples, all have, when adult, a rugose skull with more or less developed postorbital processes to the frontoparietal bones, and the skin adheres to the latter and to the nasals. It is therefore considered advisable to regard them as belonging to a species distinct from, though very closely allied to, *R. maculatus*. The coloration varies exceedingly, and the hinder side of the thighs may be uniform or light-spotted. A variety (*sexvirgata* s. *quadrilineata*) is characterized by regular dark bands along the head and back.

From snout to vent 3·2 inches.

Hab. From the Eastern Himalayas (Sikhim), Assam, Burma, and Southern China, to the Malay Peninsula and Archipelago.

61. Rhacophorus maculatus.

Hyla maculata, *Gray, Ill. Ind. Zool.* i, pl. lxxxii, fig. 1.
Polypedates leucomystax, *Dum. & Bibr. Erp. Gén.* viii, p. 519.
Polypedates leucomystax, part., *Kelaart, Prodr.* p. 193.
Polypedates maculatus, part., *Günth. Cat. Batr. Sal.* p. 78; *id. Rept. B. I.* p. 428.
Polypedates biscutiger, *Peters, MB. Ak. Berl.* 1871, p. 649.
Rhacophorus maculatus, part., *Bouleng. Cat. Batr. Sal.* p. 83.
Rhacophorus maculatus, *Bouleng. P. Z. S.* 1889, p. 30.

Vomerine teeth in two more or less oblique series between the choanæ or commencing close to the inner front edge of the latter. Skin of head free; a more or less developed bony arch, sometimes slender and partly ligamentous, sometimes very thick and swollen, extending on each side from the posterior border of the frontoparietal bones to the squamosals; snout obtusely acuminate, about as long as the diameter of the orbit; canthus rostralis distinct; loreal region concave; nostril much nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum about three fourths the diameter of the eye. Fingers with a slight rudiment of web; toes two-thirds webbed; disks moderate, that of the third finger measuring two fifths to one half the diameter of the eye; subarticular tubercles moderate. The tibio-tarsal articulation reaches the eye, or between the eye and the tip of the snout. Skin smooth above, granulate on the belly and under the thighs; a fold from the eye to the shoulder. Brownish, yellowish, greyish, or whitish above, with darker spots or markings;

rarely with an hourglass-shaped figure on the back of the head and the front of the back; loreal and temporal regions dark; a light line on the upper lip; hinder side of thighs with round yellow spots, which are usually separated by a dark brown or purplish network. Male with internal vocal sacs.

From snout to vent 3 inches.

Hab. India and Ceylon. The "Chunam Frog" of Madras.

62. Rhacophorus cruciger.

Polypedates leucomystax, part., *Kelaart, Prodr.* p. 193.
Polypedates cruciger, *Blyth, J. A. S. B.* xxi, 1852, p. 355; *id. in Kelaart, op. cit., App.* p. 48.
Polypedates maculatus, part., *Günth. Cat. Batr. Sal.* p. 78; *id. Rept. B. I.* p. 428.
Rhacophorus maculatus, part., *Bouleng. Cat. Batr. Sal.* p. 83.
Rhacophorus cruciger, *Nevill, Taprobanian*, iii, 1888, p. 6; *Bouleng. P. Z. S.* 1889, p. 31.

Closely allied to the preceding, but skin of head adhering to the rugose nasal and frontoparietal bones in the adult; a bony, slender, parieto-squamosal arch. Tympanum at least three fourths the diameter of the eye. Disk of third finger one half to three fourths the diameter of the eye. Toes about three-fourths webbed. Tibio-tarsal articulation reaching the tip of the snout. A dark hour-glass-shaped marking or **X** from between the eyes to the middle of the back; hinder side of thighs without or with small light spots.

From snout to vent 3·5 inches.

Hab. Ceylon.

63. Rhacophorus eques.

Polypedates eques, *Günth. Cat. Batr. Sal.* p. 80, pl. vi, fig. B; *id. Rept. B. I.* p. 431.
Rhacophorus eques, *Bouleng. Cat. Batr. Sal.* p. 85.

Vomerine teeth in two oblique series commencing from the inner front edge of the choanæ. Snout triangular, a little longer than the diameter of the orbit; canthus rostralis angular; loreal region concave; nostril much nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum at least two thirds the diameter of the eye. Fingers with a rudiment of web; toes two-thirds webbed; disks large, of third finger two thirds the diameter of the eye; subarticular tubercles moderate. The tibio-tarsal articulation reaches between the eye and the tip of the snout. Upper parts smooth; beneath granular; a narrow glandular fold from behind the eye to beyond the shoulder; another along the forearm and tarsus; tibio-tarsal articulation with a cutaneous spur; vent surrounded by large tubercles. Greyish above, with a dark hourglass-shaped marking on the back, commencing between the eyes; legs cross-barred. Male with internal vocal sacs.

From snout to vent 3 inches.

Hab. Ceylon.

64. Rhacophorus nasutus.

Polypedates nasutus, *Günth. P. Z. S.* 1868, p. 486, pl. xxxix, fig. 2.
Rhacophorus nasutus, *Bouleng. Cat. Batr. Sal.* p. 85.

Very closely allied to *R. eques.* Snout much longer, equalling about twice the diameter of the eye, its extremity projecting in a pointed cutaneous appendage. Brownish olive above; legs with dark cross bands; two blackish lines along each side of the body, and another along the middle of the throat; lower lip black-margined.

From snout to vent 2·2 inches.

Hab. Ceylon.

65. Rhacophorus reticulatus.

Polypedates reticulatus, *Günth. Rept. B. I.* p. 431, pl. xxvi, fig. F.
Rhacophorus reticulatus, *Bouleng. Cat. Batr. Sal.* p. 80.

Vomerine teeth in two oblique groups between the choanæ. A conical papilla on the middle of the tongue. Snout rounded; canthus rostralis distinct; loreal region slightly concave; nostril near the end of the snout, its distance from the eye equalling the diameter of the latter; interorbital space broader than the upper eyelid; tympanum half the diameter of the eye. Fingers with a rudiment of web; toes nearly entirely webbed; disks as large as the tympanum; subarticular tubercles moderate. The tibio-tarsal articulation reaches the tip of the snout, or slightly beyond. Skin smooth above, granular beneath; a narrow fold above the tympanum. Brown above, with small darker spots; a more or less distinct dark cross band between the eyes; flanks and hinder side of thighs with a network of dark brown lines; legs indistinctly cross-barred; throat brown-spotted.

From snout to vent 2·5 inches.

Hab. Ceylon.

Günther, A. M. N. H. (4) xvii, 1876, p. 379, pl. xx, fig. C, has recorded the interesting fact that the female of this frog carries the ova attached to the belly; these ova, in the specimen examined, were only twenty in number, of the size of a hemp-seed, firmly adherent to one another, and leaving shallow impressions in the skin of the abdomen of the mother. This mode of nursing is analogous to that of the European Midwife Toad, *Alytes obstetricans*, in which, however, it is the male that takes charge of the progeny, the eggs being attached round the legs.

66. Rhacophorus dubius.

Ixalus jerdonii, *Günth. P. Z. S.* 1875, p. 575.
Rhacophorus dubius, *Bouleng. Cat. Batr. Sal.* p. 81, pl. viii, fig. 2.

Vomerine teeth —? Tongue with a free conical papilla in the middle. Snout rounded, not longer than the diameter of the orbit;

canthus rostralis distinct; loreal region slightly concave; nostril a little nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum one third the diameter of the eye. Fingers slightly, toes hardly two-thirds webbed, the web scarcely developed between the two inner toes; disks of fingers as large as the tympanum, of toes rather smaller; subarticular tubercles well developed, The tibio-tarsal articulation reaches the eye. Skin smooth above, granular beneath; a fold from the eye to the shoulder. Reddish brown above, with indistinct markings; thighs colourless in front and behind; legs with rather indistinct dark cross bands.

From snout to vent 1·5 inches.

Hab. Darjeeling. A single specimen is known, in which the absence of vomerine teeth is probably accidental.

67. Rhacophorus nanus.

Polypedates nanus, *Günth. P. Z. S.* 1868, p. 485, pl. xxxix, fig. 3.
Ixalus macropus, *Günth. l. c.* p. 484, fig. 4.
Rhacophorus nanus, *Bouleng. Cat. Batr. Sal.* p. 81.

Vomerine teeth in two small groups between the choanæ. A conical papilla on the middle of the tongue. Snout rounded or subacuminate, a little shorter than the diameter of the orbit; canthus rostralis angular; loreal region slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid or broader; tympanum one third the diameter of the eye. Fingers with a rudiment of web; toes half webbed in the young, generally almost entirely in the adult; disks of fingers and toes as large as the tympanum; subarticular tubercles moderate. The tibio-tarsal articulation reaches the tip of the snout, or somewhat beyond. Upper parts smooth or with small tubercles; a fold above the tympanum; belly and under surface of thighs granular. Brownish above, with symmetrical dark markings on the back; sometimes a light vertebral stripe; limbs with dark cross bars; beneath yellowish, throat sometimes brown spotted. Male with internal vocal sacs.

From snout to vent 1·6 inches.

Hab. Ceylon.

68. Rhacophorus jerdonii.

Polypedates jerdonii, *Günth. P. Z. S.* 1875, p. 571.
Rhacophorus jerdonii, *Bouleng. Cat. Batr. Sal.* p. 80, pl. viii, fig. 1.

Vomerine teeth in two small oblique groups between the choanæ. Snout rounded, a little shorter than the diameter of the orbit; canthus rostralis rounded; loreal region very slightly concave; nostril equally distant from the end of the snout and the eye; interorbital space broader than the upper eyelid; tympanum one

third the diameter of the eye. Fingers with a very distinct web at the base; toes two-thirds webbed; disks larger than the tympanum; subarticular tubercles moderate. The tibio-tarsal articulation reaches the eye. Skin smooth, granular on the belly and under the thighs; a fold above the tympanum. Greyish above, forehead and sides of the body lighter; legs with irregular dark cross bands; sides of thighs colourless; throat brown-spotted. Male with internal vocal sacs.

From snout to vent 1·6 inches.

Hab. Darjeeling.

69. Rhacophorus pleurostictus.

Polypedates pleurostictus, *Günth. Rept. B. I.* p. 430, pl. xxvi, fig. I.
Rhacophorus pleurostictus, *Bouleng. Cat. Batr. Sal.* p. 79.

Vomerine teeth in two small oblique groups between the choanæ. Snout rounded, as long as the diameter of the orbit; canthus rostralis distinct; loreal region concave; nostril a little nearer the end of the snout than the eye; interorbital space as broad as the upper eyelid or a little broader; tympanum one third to one half the diameter of the eye. Fingers with a very distinct web at the base; toes almost entirely webbed; disks of fingers at least as large as the tympanum; subarticular tubercles well developed. The tibio-tarsal articulation reaches to the eye, or to between the latter and the end of the snout. Upper surfaces smooth or finely granular; belly and lower surface of thighs granular; a strong fold from the eye to the shoulder. Green or greenish above, usually with large insuliform dark spots edged with darker and lighter; groin and sides of thighs purplish brown with yellowish spots or marblings; limbs with dark cross bands. Male with internal vocal sacs.

From snout to vent 2·4 inches.

Hab. Nilgiri and Anaimalai Hills, Malabar.

70. Rhacophorus microtympanum.

Polypedates microtympanum, *Günth. Cat. Batr. Sal.* p. 77, pl. vi, fig. A; *id. Rept. B. I.* p. 430.
Rhacophorus microtympanum, *Bouleng. Cat. Batr. Sal.* p. 79.

Vomerine teeth in two small oblique groups between the choanæ. Snout rounded, shorter than the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril a little nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum one third or two fifths the diameter of the eye. Fingers with a rudiment of web; toes half webbed, the web very short between the inner toes; disks as large as the tympanum; subarticular tubercles well developed. The tibio-tarsal articulation reaches to between the eye and the

tip of the snout. Skin smooth above, or with small warts; a narrow fold above the tympanum; beneath granular. Grey or brownish above, spotted with blackish; generally a dark curved dorso-lateral band and a cross band between the eyes; the dorsal region sometimes dark brown with a light vertebral line; limbs with dark cross bands; sides of thighs dotted or marbled with blackish; throat frequently brown-dotted. Male with internal vocal sacs.

From snout to vent 2 inches.

Hab. Ceylon.

71. Rhacophorus stictomerus.

Ixalus stictomerus, *Günth. P. Z. S.* 1875, p. 575, pl. lxvi, fig. C.
Rhacophorus stictomerus, *Bouleng. Cat. Batr. Sal.* p. 78.

Vomerine teeth in two small groups close to the inner edge of the choanæ. Snout rather pointed; canthus rostralis distinct; loreal region nearly flat; nostril nearer to the tip of the snout than to the eye; interorbital space scarcely broader than the upper eyelid; tympanum one third the diameter of the eye. Fingers slightly, toes two-thirds webbed; disks and subarticular tubercles moderate. The tibio-tarsal articulation reaches in front of the eye. Skin smooth, granular on the belly and under the thighs; a fold above the tympanum. Light brown above, with indistinct symmetrical markings; loreal region dark brown, a black temporal streak; limbs indistinctly cross-barred; front and hinder side of thighs minutely speckled with blackish.

From snout to vent 1·3 inches.

Hab. Ceylon.

72. Rhacophorus fergusonii.

Rhacophorus fergusonii, *Bouleng. Cat. Batr. Sal.* p. 82, pl. viii, fig. 3.

Vomerine teeth in two very small groups close to the inner front edges of the choanæ. Snout subtriangular, as long as the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space a little broader than the upper eyelid; tympanum half the diameter of the eye. Fingers with a rudiment of web; toes three-fourths webbed; disks a little smaller than the tympanum; subarticular tubercles moderate. The tibio-tarsal articulation reaches between the eye and the tip of the snout. Upper parts smooth; a fold above the tympanum; belly and lower surface of thighs granular; lower surface of forearm and tarsus tubercular. Greyish above, indistinctly marbled with darker; limbs with dark cross bands; throat speckled with brown.

From snout to vent 1·5 inches.

Hab. Ceylon.

73. Rhacophorus cavirostris.

Polypedates cavirostris, *Günth. P. Z. S.* 1868, p. 486, pl. xxxix, fig. 1.
Ixalus fimbriatus, *Günth. A. M. N. H.* (4) ix, 1872, p. 87.
Rhacophorus cavirostris, *Bouleng. Cat. Batr. Sal.* p. 82.

Vomerine teeth in two small groups between the choanæ. Snout rounded, as long as the diameter of the orbit; canthus rostralis angular; loreal region deeply concave; nostril much nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid or broader; tympanum nearly half the diameter of the eye. Fingers slightly, toes almost entirely webbed; disks about two thirds the diameter of the eye; subarticular tubercles moderate. The tibio-tarsal articulation reaches to between the eye and the tip of the snout. Upper parts with small tubercles; a fold above the tympanum; outer edge of forearm and tarsus with a denticulate fringe; a patch of conical tubercles below the vent; belly and underside of thighs granular. Reddish brown above, marbled with dark brown and speckled with black; limbs with dark cross bands; sides of thighs not coloured; throat dotted with brown. Male with internal vocal sacs.

From snout to vent 2 inches.

Hab. Ceylon.

Genus IXALUS,

Dum. & Bibr. Erp. Gén. viii, p. 523, 1841.

Pupil horizontal. Tongue free and deeply notched behind. Vomerine teeth none. Tympanum distinct or hidden. Fingers free or webbed at the base; toes webbed; tips of fingers and toes dilated into regular disks. Outer metatarsals separated by a groove or narrow web. Omosternum and sternum with a bony style. An intercalary ossification or additional phalanx between the penultimate and distal phalanges; the latter obtuse.

Distribution. The head-quarters of this genus are in Southern India and Ceylon, which yield 14 out of the 20 known species, the rest being from Burma, Indo-China, and the Malay Peninsula and Archipelago.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Tongue without conical papilla.
- *a.* Tympanum perfectly distinct, half diameter of eye.
  - *a'.* Heel without dermal appendage.
    - *a''.* Toes two-thirds webbed; disks very small . . . . *I. oxyrhynchus*, p. 482.
    - *b''.* Toes one-third or half webbed; disks well developed . . . . *I. leucorhinus*, p. 483.
  - *b'.* Heel with a triangular or subconical dermal appendage; upper parts with large conical warts . . . . *I. schmardanus*, p. 483.

b. Tympanum perfectly distinct, not half diameter of eye; toes not quite half webbed; a narrow glandular line along middle of head and back .... *I. nasutus*, p. 584.
c. Tympanum indistinct or hidden.
  a'. Throat smooth.
    a''. Fingers quite free; tibio-tarsal articulation reaching tip of snout, or a little beyond; hind limbs with dark cross bands .... *I. hypomelas*, p. 484.
    b''. Fingers with a rudiment of web; tibio-tarsal articulation reaching eye; limbs yellowish, speckled with brown .... *I. vittatus*, p. 485.
    c''. Fingers with a rudiment of web; tibio-tarsal articulation reaching between eye and tip of snout; upper arm colourless, thigh with a narrow green band .... *I. pulcher*, p. 485.
  b'. Throat granular.
    a''. Thigh with a green longitudinal band, sides colourless.
      α. Tibio-tarsal articulation reaching tip of snout, or nearly as far; upper arm not coloured.............. *I. femoralis*, p. 485.
      β. Tibio-tarsal articulation reaching eye; upper arm usually green above .... *I. beddomii*, p. 486.
    b''. Thigh coloured above and on sides.
      α. Tibio-tarsal articulation reaching posterior border of eye; fingers with a distinct rudiment of web. *I. adspersus*, p. 486.
      β. Tibio-tarsal articulation reaching anterior border of eye, or between latter and tip of snout; fingers free or with a very indistinct rudiment of web .... *I. variabilis*, p. 487.

B. Tongue with a free, pointed papilla in anterior part of median line.
  a. Snout pointed; hinder side of thigh not coloured, or merely with brown reticulation .... *I. signatus*, p. 487.
  b. Snout rounded.
    a'. Toes half webbed; tibio-tarsal articulation not reaching eye .... *I. flaviventris*, p. 487.
    b'. Toes half webbed; tibio-tarsal articulation reaching beyond eye .... *I. chalazodes*, p. 488.
    c'. Toes webbed at base.................. *I. glandulosus*, p. 488.

74. Ixalus oxyrhynchus.

Ixalus oxyrhynchus, *Günth. A. M. N. H.* (4) ix, 1872, p. 88; *Bouleng. Cat. Batr. Sal.* p. 97, pl. x, fig. 5.

Snout pointed, longer than the diameter of the orbit; canthus rostralis angular; loreal region plane, vertical; nostril nearer

to the tip of the snout than to the eye; interorbital space much broader than the upper eyelid; tympanum distinct, half the diameter of the eye. Fingers free; toes two-thirds webbed; disks very small; subarticular tubercles well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout or beyond. Skin smooth, granular on the belly and under the thighs. Light brown above, with a large dark spot; loreal and temporal regions blackish brown; throat dotted with brown.

From snout to vent 1 inch.

Hab. Central Ceylon.

75. Ixalus leucorhinus.

Ixalus leucorhinus, *Martens, Nomencl. Rept. Mus. Berol.* p. 36; *Bouleng. Cat. Batr. Sal.* p. 98.

Ixalus temporalis, *Günth. Rept. B. I.* p. 434, pl. xxvi, fig. E.

? Ixalus punctatus, *Anders. J. A. S. B.* xl, 1871, p. 27.

Snout acuminate, a little longer than the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril nearer the tip of the snout than the eye; interorbital space broader than the upper eyelid; tympanum distinct, half the diameter of the eye. Fingers very slightly webbed; toes half or one-third webbed; disks and subarticular tubercles moderate; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches to between the eye and the tip of the snout. Skin smooth above, granular on the belly and under the thighs; a fold from the eye to the shoulder. Brown or olive above; a dark band below the canthus rostralis and on the temporal region; sometimes a large hexagonal or triangular light spot on the snout; generally a dark band between the eyes, and another arched one on each side of the back: sometimes a light vertebral line or band, in some instances extending along the hind limbs; throat generally dotted with brown, sometimes quite brown with a whitish median line. Male with an internal vocal sac.

From snout to vent 1·3 inches.

Hab. Ceylon and hills near Malabar coast as far north as North Canara.

76. Ixalus schmardanus.

Polypedates? schmardana, *Kelaart, Prodr.* ii, p. 22; *Günth. Rept. B. I.* p. 433.

Ixalus schmardanus, *Bouleng. Cat. Batr. Sal.* p. 99.

Snout subtriangular, slightly longer than the diameter of the orbit; canthus rostralis distinct; loreal region concave; nostril nearer the tip of the snout than the eye; interorbital space as broad as the upper eyelid; tympanum distinct, half the diameter of the eye. Fingers free, toes half webbed; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation

reaches nearly to the tip of the snout. Above with large warts, conical on the eyelids, sides, back, and limbs, confluent into symmetrical lines on the head; a spur-like appendage at the tibio-tarsal joint; granular beneath, the granules larger round the lip. Olive above, indistinctly spotted; flanks, belly, lower surface of limbs, and hinder side of thighs white, with large dark brown marblings. Male with an internal vocal sac.

From snout to vent 1·2 inches.

Hab. Ceylon.

77. Ixalus nasutus.

Ixalus nasutus, *Günth. P. Z. S.* 1868, p. 484; *Bouleng. Cat. Batr. Sal.* p. 100, pl. x, fig. 6.

Snout pointed, a little longer than the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum distinct, one third the diameter of the eye. Fingers free, toes not quite half webbed; disks as large as the tympanum; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches to between the eye and the tip of the snout. Above with very small warts or oblique granular lines; a very narrow, whitish granular raised line along the middle of the head and back; beneath granular. Grey above, clouded with darker; loreal and temporal regions blackish; limbs with dark cross bars; lower parts spotted with brown. Male with an internal vocal sac.

From snout to vent 1 inch.

Hab. Ceylon.

78. Ixalus hypomelas.

Ixalus hypomelas, *Günth. A. M. N. H.* (4) xvii, 1876, p. 380; *Bouleng. Cat. Batr. Sal.* p. 97, pl. x, fig. 4.

Snout obtuse, as long as the diameter of the orbit; canthus rostralis angular; loreal region plane, nearly vertical; nostril nearer to the tip of the snout than to the eye; interorbital space a little broader than the upper eyelid; tympanum small, indistinct. Fingers free; toes webbed at the base; disks moderate; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout, or somewhat beyond. Skin smooth above, feebly granular on the belly and under the thighs. Dark brown above and beneath; a darker band on the side of the head and body; belly and under surface of limbs marbled with whitish; often a white line across the breast and along the under surface of the fore limbs, crossing another one extending from chin to vent; sometimes a light vertebral line.

From snout to vent 0·8 inch.

Hab. Ceylon.

79. Ixalus vittatus.

Ixalus vittatus, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 421, pl. iv, fig. 2.

Snout pointed, scarcely longer than the diameter of the orbit; canthus rostralis obtuse; loreal region slightly concave; nostril slightly nearer to the end of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum hidden. Fingers with a rudiment of web; toes three-fourths webbed; disks well developed; a very feeble inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye. Skin smooth, granular on the belly and under the thighs. Yellowish above, closely speckled with brown; the specks densest on the side of the head, where they form a darker band passing through the eye; a broad yellowish-white lateral band, continued forwards as a narrow line along the edge of the upper eyelid and the canthus rostralis to the tip of the snout, where it unites with its fellow on the other side; lower surfaces white.

From snout to vent 1 inch.

Hab. Bhámo, Upper Burma.

80. Ixalus pulcher.

Ixalus pulcher, *Bouleng. Cat. Batr. Sal.* p. 469.

Snout slightly pointed, a little shorter than the diameter of the orbit; canthus rostralis distinct; loreal region very slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum small, indistinct. Fingers with a rudiment of web; toes half or two-thirds webbed; disks well developed; a very small inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout or between the latter and the eye. Skin smooth above, granular on the belly and under the thighs; a fold from the eye to the shoulder. Green (blue or purple in spirit) above, usually uniform, sometimes with small black spots; a purplish-brown streak on canthus rostralis and usually on temporal fold; loreal region white, uniform, or with purplish-brown spots, or purplish brown uniform or dotted with whitish; arms, and often forearms, colourless; thighs colourless except a green stripe on their upper surface. Male with an external vocal sac, situated on the thoracic region.

From snout to vent 0·9 inch.

Hab. Manantoddy, Wynaad.

81. Ixalus femoralis.

Ixalus femoralis, *Günth. Rept. B. I.* p. 434, pl. xxvi, fig. D; *Bouleng. Cat. Batr. Sal.* p. 101.
Ixalus pulchellus, *Günth. A. M. N. H.* (4) ix, 1872, p. 88.
Ixalus fergusonii, *Günth. A. M. N. H.* (4) xvii, 1876, p. 379.

Snout rounded, hardly as long as the diameter of the orbit;

canthus rostralis moderately distinct; loreal region very oblique and very slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum small, hidden. Fingers free, toes two-thirds or half webbed; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the tip of the snout, or nearly as far. Skin smooth or granular above; a slight fold from the eye to the shoulder; throat, belly, and lower surface of thighs granular, the granules very large on the belly. Green above (bluish or purple in spirit), immaculate or with black specks; upper arm colourless, thigh with a green stripe on its upper surface. Male with an internal vocal sac.

From snout to vent 1·2 inches.

Hab. Ceylon.

82. Ixalus beddomii.

Ixalus beddomii, *Günth. P. Z. S.* 1875, p. 575; *Bouleng. Cat. Batr. Sal.* p. 101, pl. x, fig. 7.

Snout rounded, as long as the diameter of the orbit; canthus rostralis moderately distinct; loreal region very slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum small, hidden. Fingers free; toes half webbed; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye. Skin smooth or finely granular above, granular beneath; a fold from the eye to the shoulder. Uniform green above (bluish or purplish in spirit); thighs colourless, except a green stripe along their upper surface. Male with an internal vocal sac.

From snout to vent 1·2 inches.

Hab. Travancore and Anaimalai hills, 4000–4700 feet.

83. Ixalus adspersus.

Ixalus adspersus, *Günth. A. M. N. H.* (4) ix, 1872, p. 87: *Bouleng. Cat. Batr. Sal.* p. 105, pl. x, fig. 8.

Snout rounded, as long as the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril a little nearer to the tip of the snout than to the eye; interorbital space a little broader than the upper eyelid; tympanum small, indistinct. Fingers with a distinct rudiment of web; toes two-thirds webbed; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the posterior border of the eye. Skin smooth above, granular beneath; a fold from the eye to the shoulder. Upper parts dark violet-brown, with numerous round, smaller and larger yellowish spots; hinder side of thighs and throat and breast marbled with brown. Male with an internal vocal sac, the openings of which are larger than in the other species of *Ixalus*.

From snout to vent 1·3 inches.

Hab. Central Ceylon. A single specimen is known.

84. Ixalus variabilis.

Ixalus variabilis, *Günth. Cat. Batr. Sal.* p. 74, pl. iv, figs. A & B; *id. Rept. B. I.* p. 433; *Bouleng. Cat. Batr. Sal.* p. 102.
? Phyllomedusa wynaadensis, *Jerdon, J. A. S. B.* xxii, 1853, p. 533.

Snout rounded or subacuminate, as long as the diameter of the orbit or rather shorter; canthus rostralis distinct; loreal region oblique and slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space a little broader than the upper eyelid; tympanum indistinct, about half the diameter of the eye. Fingers free or with a very slight rudiment of web; toes half or two thirds webbed; disks moderate; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the anterior border of the eye, or between the latter and the tip of the snout. Skin smooth above, or with very small scattered tubercles; a fold from the eye to the shoulder; throat, belly, and lower surface of thighs granular. Above bluish (in spirit), greenish, brownish, greyish, or blackish, uniform or variously spotted, speckled or marbled with darker or lighter; variations of colour endless. Male with an internal vocal sac.

From snout to vent 1·75 inches.

Hab. Ceylon; hills near Malabar coast, South India, as far north as the Nilgiris and Wynaad.

85. Ixalus signatus.

Ixalus signatus, *Bouleng. Cat. Batr. Sal.* p. 106, pl. xi, fig. 2.

Tongue with a small pointed papilla in the anterior part of the median line. Snout acuminate, as long as the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril nearer to the tip of the snout than to the eye; tympanum small, hidden. Fingers free; toes half webbed; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye, or somewhat beyond. Skin smooth above, granular beneath. Greyish or brownish above; a dark cross band between the eyes and a large X-shaped marking on the back; upper lip with a few white spots; limbs with dark cross bars; hinder side of thighs not coloured, or with brown vermiculations; beneath immaculate. Male with au internal vocal sac.

From snout to vent 1·25 inches.

Hab. Malabar.

86. Ixalus flaviventris.

Ixalus flaviventris, *Bouleng. Cat. Batr. Sal.* p. 105, pl. xi, fig. 1.

Tongue with a pointed papilla in the anterior part of the median line. Snout rounded, as long as the diameter of the orbit; canthus rostralis distinct; loreal region very slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space as broad as the upper eyelid; tympanum small, indistinct. Fingers free;

toes half webbed; disks well developed; a very small inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye. Skin smooth above, granular below; a fold from the eye to the shoulder. Above dark brown with round yellow spots, or brown with dark vermiculations or spots; hinder side of thighs dark brown, with round yellow spots; lower parts yellow, marbled with brown. Male with an internal vocal sac.

From snout to vent 1·25 inches.

Hab. Malabar.

87. Ixalus chalazodes.

Ixalus chalazodes, *Günth. P. Z. S.* 1875, p. 574, pl. lxvi, fig. B; *Bouleng. Cat. Batr. Sal.* p. 105.

Tongue with a pointed papilla in the anterior part of the median line. Snout rounded, as long as the diameter of the orbit; canthus rostralis indistinct; loreal region very slightly concave; nostril nearer to the tip of the snout than to the eye; interorbital space broader than the upper eyelid; tympanum small, hidden. Fingers free; toes half webbed; disks well developed; subarticular tubercles double under the second and fourth fingers; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches to between the eye and the tip of the snout. Skin of upper parts smooth; a few round tubercles on the flanks, on the hind part of the back, and on the metatarsus; a slight fold from the eye to the shoulder; beneath granular. Uniform green above, the round tubercles white; lower parts uniform white.

From snout to vent 1·1 inches.

Hab. Travancore.

88. Ixalus glandulosus.

Ixalis? glandulosa, *Jerdon, J. A. S. B.* xxii, 1853, p. 532.
? Phyllomedusa tinniens, *Jerdon, l. c.* p. 533.
Ixalus montanus, *Günth. P. Z. S.* 1875, p. 574, pl. lxvi, fig. A.
Ixalus glandulosus, *Bouleng. Cat. Batr. Sal.* p. 103.

Tongue with a pointed papilla in the anterior part of the median line. Snout rounded, as long as the diameter of the orbit; canthus rostralis distinct; loreal region slightly concave; nostril equally distant from the eye and the tip of the snout; interorbital space broader than the upper eyelid; tympanum small, hidden. Fingers free; toes webbed at the base; disks well developed; a small inner metatarsal tubercle. The tibio-tarsal articulation reaches the eye, or not quite so far. Upper surfaces smooth or with small tubercles; sides generally glandular or tubercular; a fold from the eye to the shoulder; lower surfaces granular. Dark purplish brown above, uniform or with indistinct markings, or greyish brown with symmetrical darker or lighter markings; beneath immaculate or spotted with brown. Male with an internal vocal sac.

From snout to vent 1·5 inches.

Hab. Hills near Malabar coasts, up to 6000 feet (Nilgiris, Anaimalais, Travancore).

Family II. ENGYSTOMATIDÆ.

Jaws toothless; diapophyses of sacral vertebra dilated.

This family includes terrestrial, aquatic, and burrowing types, but no arboreal forms. Its range extends over Africa and Madagascar, the East Indies, Southern China, Papuasia, and America. Of the 22 genera known at present, six are American, three African, one African and Malayan, two restricted to Madagascar, three are Papuasian, one Malayan, and six are represented in India and Burma.

Synopsis of Indian, Ceylonese, and Burmese Genera.

A. Præcoracoids present.
- *a.* Pupil vertical; palate without ridges. MELANOBATRACHUS, p. 489.
- *b.* Pupil horizontal; a denticulated dermal ridge between choanæ ...... CALOPHRYNUS, p. 490.

B. No præcoracoids.
- *a.* Tongue elliptical; a dermal transverse ridge between choanæ...... MICROHYLA, p. 491.
- *b.* Tongue elliptical or pyriform; palatine bones forming a sharp ridge across palate .... CALLULA, p. 493.
- *c.* Tongue oval; two small bony prominences between choanæ .... CACOPUS, p. 495.
- *d.* Tongue divided into two lateral halves by a deep groove .... GLYPHOGLOSSUS, p. 497.

Genus MELANOBATRACHUS,

Beddome, P. Z. S. 1878, p. 722.

Pupil vertical. Tongue elliptical, entire and free behind. Palate smooth. No tympanic disk. Fingers free; toes webbed, the tips not dilated. Outer metatarsals united. Coracoids and præcoracoids nearly parallel, the latter very weak; no omosternum; sternum cartilaginous. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges simple.

A single species.

89. Melanobatrachus indicus.

Melanobatrachus indicus, *Beddome, P. Z. S.* 1878, p. 722; *Bouleng. Cat. Batr. Sal.* p. 157.

Snout short, blunt, with rather indistinct canthus rostralis; interorbital space broader than the upper eyelid. Fingers short, depressed, first much shorter than second; toes rather short, depressed, one-third webbed; subarticular and metatarsal tubercles very indistinct. The tarso-metatarsal articulation reaches in front

of the eye. Upper surfaces tubercular; sides and lower surfaces smooth. Black; tubercles of back grey; belly dotted with greyish; a large scarlet spot on the front and lower surface of the thigh. Male with a subgular vocal sac.

From snout to vent 1·3 inches.

Hab. Travancore and Anaimalai Hills, 3000–4500 feet.

Genus **CALOPHRYNUS**,

Tschudi, Class. Batr. p. 86, 1838.

Pupil horizontal; tongue elliptical, entire and free behind. A denticulated dermal ridge across the palate between the choanæ, and two others in front of the œsophagus. Tympanum distinct. Fingers free; toes webbed, the tips not dilated into regular disks. Outer metatarsals united. Coracoids broad; præcoracoids weak, parallel to the coracoids; omosternum and sternum cartilaginous. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges simple.

Fig. 134.—Palate of *Calophrynus pleurostigma.*

Distribution. Three species are known, one from Southern China, Burma, and Borneo, a second from Borneo, and a third from Madagascar.

90. Calophrynus pleurostigma.

Calophrynus pleurostigma, *Tschudi, Class. Batr.* p. 86; *Bouleng. Cat. Batr. Sal.* p. 158.
Engystoma interlineatum, *Blyth, J. A. S. B.* xxiii, 1854, p. 732.
Berdmorea interlineata, *Stol. P. A. S. B.* 1872, p. 146.

Head much depressed; snout prominent, truncated; canthus rostralis angular; loreal region vertical; interorbital space broader than the upper eyelid; tympanum nearly as large as the eye. Fingers short, first a little shorter than second, which is longer than fourth; toes short, half webbed, third longer than fifth; tips of fingers and toes slightly swollen; subarticular tubercles very prominent; two small, rather indistinct metatarsal tubercles. The tarso-metatarsal articulation reaches the eye. Skin of the back smooth or tubercular, very thick, glandular; belly granular; a more or less distinct lateral fold, commencing from the eye. Brown or reddish above, with or without longitudinal dark bands; a dark, light-edged round spot on the loin; sides of body dark brown; limbs with dark cross bands.

From snout to vent 2 inches.

Hab. Burma (Pegu, Bhamó, Kakhyen Hills, Tenasserim), Southern China, Borneo.

Genus MICROHYLA,

Tschudi, Class. Batr. p. 71, 1838.

Pupil vertical. Tongue elliptical, entire, free behind. A more or less distinct cutaneous ridge across the palate between the choanæ, and another in front of the œsophagus. Tympanum hidden. Fingers free; toes more or less webbed, sometimes very slightly; tips of fingers and toes blunt or more or less dilated. Outer metatarsals united. No præcoracoids; no omosternum; sternum cartilaginous. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges simple.

Distribution. This genus is restricted to China and the East Indies; 7 species are known, three of which are found in India, Ceylon, and Burma.

Synopsis of Indian, Ceylonese, and Burmese Species.

Toes webbed at base; metatarsal tubercles strong, compressed....................	*M. rubra*, p. 491.
Toes webbed at base; metatarsal tubercles very small	*M. ornata*, p. 491.
Toes entirely webbed......................	*M. berdmorii*, p. 492.

91. Microhyla rubra.

Engystoma rubrum, *Jerdon, J. A. S. B.* xxii, 1853, p. 534.
Microhyla rubra, *Bouleng. Cat. Batr. Sal.* p. 164.

Habit stout. Snout rounded, a little shorter than the diameter of the orbit; interorbital space broader than the upper eyelid. Fingers moderate, first much shorter than second; toes moderate, one-third webbed; tips of fingers and toes not swollen; subarticular tubercles very distinct; two rather large, oval, compressed, very prominent metatarsal tubercles, outer somewhat larger than inner. The tibio-tarsal articulation reaches somewhat beyond the shoulder, never to the eye. Skin smooth. Reddish brown above, sides darker; a dark brown line from the tip of the snout through the eye along the side of the back to the groin; a dark brown mark across the thigh, beginning on the loin; limbs with more or less distinct dark cross bars; sometimes a dark X-shaped marking on the anterior portion of the back, commencing between the eyes; beneath whitish, immaculate or with a few brown dots on the throat. Male with a subgular vocal sac, and the throat black.

From snout to vent 1·2 inches.

Hab. Assam, Nellore, Madras Presidency, and Ceylon.

92. Microhyla ornata.

Engystoma ornatum, *Dum. & Bibr. Erp. Gén.* viii, p. 745.
Engystoma carnaticum, *Jerdon, J. A. S. B.* xxii, 1853, p. 534.
? Engystoma malabaricum, *Jerdon, l. c.*
Diplopelma ornatum, *Günth. Rept. B. I.* p. 417.
Microhyla ornata, *Bouleng. Cat. Batr. Sal.* p. 165.

Habit moderately slender. Snout obtuse, as long as the diameter of the orbit or a little longer; interorbital space broader than the upper eyelid. Fingers rather slender, first much shorter than second; toes rather slender, with a slight rudiment of web; tips of fingers and toes swollen into very small disks; subarticular tubercles very distinct; two small, subequal metatarsal tubercles. The tibio-tarsal articulation reaches the eye, or between the latter and the shoulder. Skin smooth. Reddish or greyish olive above, with a large dark marking on the back, beginning between the eyes and widening as it extends to the hind part of the body; on each side of this marking are undulating longitudinal dusky lines, which may be absent; a dark band along the side of the head and body; limbs with dark cross bars; throat and chest generally greyish or brownish, dotted with white; the remainder of the lower surface whitish, immaculate. Male with a subgular vocal sac.

From snout to vent 1·1 inches.

Hab. Kashmir, India generally, Ceylon *, Assam, Burma, Southern China, and Indo-China.

93. Microhyla berdmorii.

Engystoma ? berdmorei, *Blyth, J. A. S. B.* xxiv, 1855, p. 720.
Microhyla berdmorii, *Bouleng. Cat. Batr. Sal.* p. 166.

Habit slender. Snout obtuse, as long as the diameter of the orbit or a little longer; interorbital space broader than the upper eyelid. Fingers slender, with slightly swollen tips, first much shorter than second; toes long, webbed to the tips, which are dilated into rather large disks; subarticular tubercles very distinct; two very small metatarsal tubercles. Hind limb very long, the tibio-tarsal articulation reaching beyond the tip of the snout. Skin smooth or with a few scattered indistinct tubercles on the back and sides. Brownish, olive, or pinkish above; a darker, light-edged, hourglass-shaped large spot on the anterior part of the back, beginning between the eyes, sometimes continued on the hind part of the back; black spots on the sides of the limbs and occasionally on the flanks; a chevron-shaped black marking on the anal region; throat and chest clouded with brown; the remainder of the lower surface whitish, immaculate.

From snout to vent 1·5 inches.

Hab. Pegu and Tenasserim; also the Malay Peninsula, Mr. W. L. Sclater having recently communicated to me a specimen obtained by Mr. Davison at Malacca.

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* Found in abundance in Ceylon by the Drs. Sarasin, *fide* F. Müller.

Genus CALLULA,

Gray, Zool. Misc. p. 38, 1831 (*Kaloula*).

Pupil vertical. Tongue oblong, entire and free behind. Palatine bones forming a sharp, sometimes a toothed ridge across the palate. Two cutaneous, more or less distinctly denticulated ridges across the palate, in front of the œsophagus. Tympanum hidden. Fingers free; toes free or webbed; tips of fingers and toes more or less dilated. Outer metatarsals united. No præcoracoids; no omosternum; sternum cartilaginous. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges triangular or T-shaped.

Distribution. 8 species are known, of which 3 are only found in the Malay Archipelago.

In spite of their dilated digits, these frogs are by no means arboreal. *Callula pulchra* is more a burrower; Stoliczka, who observed it near Moulmein, says it appears after sunset, crawling on old wood and feeding on white ants.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Toes one-third or half webbed .... *C. obscura*, p. 493.
B. Toes with a rudiment of web.
  a. Inner metatarsal tubercle large, sharp-edged, as long as inner toe.......... *C. pulchra*, p. 494.
  b. Inner metatarsal tubercle large, blunt, shorter than inner toe.............. *C. macrodactyla*, p. 494.
  c. Metatarsal tubercles small, scarcely prominent......................... *C. variegata*, p. 494.
C. Toes perfectly free..................... *C. triangularis*, p. 495.

94. Callula obscura.

Callula obscura, *Günth. Rept. B. I.* p. 438; *Bouleng. Cat. Batr. Sal.* p. 169, pl. xiii, fig. 3.
? Hylædactylus montanus, *Jerdon, J. A. S. B.* xxii, 1853, p. 533.

Snout short, rounded, as long as the diameter of the orbit or a little longer; interorbital space broader than the upper eyelid. Fingers moderate, the tips dilated into well-developed truncated disks; first finger shorter than second; toes moderate, one-third or half webbed, the tips slightly swollen; subarticular tubercles distinct; two small metatarsal tubercles, the inner oval, blunt, scarcely prominent, the outer minute, rounded. The tarso-metatarsal articulation reaches the eye or the tip of the snout. Skin smooth, or with small flat tubercles on the head and back; a fold from the eye to the shoulder. Above brownish or greyish, with blackish angular markings; sometimes uniform blackish brown; beneath blackish brown, spotted with whitish. Male with a subgular vocal sac.

From snout to vent 1·3 inches.

Hab. Ceylon, and hills near Malabar coast, Southern India.

95. Callula pulchra.

Kaloula pulchra, *Gray, Zool. Misc.* p. 38.
Hylædactylus bivittatus, *Cantor, J. A. S. B.* xvi, 1847, p. 1064.
Callula pulchra, *Günth. Rept. B. I.* p. 437; *Bouleng. Cat. Batr. Sal.* p. 170.

Snout short, rounded, as long as the diameter of the orbit; interorbital space broader than the upper eyelid. Fingers rather slender, the tips dilated into well-developed truncated disks; first finger shorter than second; toes moderate, slightly webbed at the base, the tips swollen; subarticular tubercles well developed; metatarsal tubercles two, oval, inner large, compressed, with sharp edge. The tarso-metatarsal articulation reaches the shoulder, or a little beyond. Skin of back with flat smooth tubercles; a fold from the eye to the shoulder, and another, more or less distinct, across the head behind the eyes. Light brown or pinkish above, generally with a large dark brown spot covering nearly the whole of the back, and a dark lateral band; sometimes with confluent spots; beneath whitish, immaculate or marbled with brown. Male with a subgular vocal sac.

From snout to vent 3 inches.

Hab. Peninsular India and Ceylon, Burma, Southern China, Indo-China, and Malay Peninsula.

96. Callula macrodactyla.

Callula macrodactyla, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 485, pl. viii, fig. 3.

Snout short, truncate, as long as the diameter of the orbit; interorbital space a little broader than the upper eyelid. Fingers very long, the length of the hand equalling the distance between the arm and the end of the snout; tips of fingers dilated into well-developed, truncated disks; first finger much shorter than second; toes moderate, with a very slight rudiment of web, the tips simply swollen; inner metatarsal tubercle large, compressed, prominent, blunt, shorter than the inner toe. The tarso-metatarsal articulation reaches the eye. Skin smooth. A blackish, bottle-shaped spot covers nearly the whole of the back to between the eyes; the rest of the upper surface of the head and body greyish; sides blackish; a whitish spot on the upper surface of the arm, another on the upper surface of the thigh near the hip, and a third on the front side of the thigh; lower surfaces dirty white, marbled with dark brown.

From snout to vent 1·25 inches.

Hab. Tenasserim.

97. Callula variegata.

Callula variegata, *Stoliczka, P. A. S. B.* 1872, p. 111; *Blanf. J. A. S. B.* xlviii, 1879, p. 116.
Callula olivacea, *Günth. P. Z. S.* 1875, p. 576, pl. lxiv, fig. B; *Bouleng. Cat. Batr. Sal.* p. 171.

Snout short, obtusely prominent, as long as the diameter of the orbit; interorbital space broader than the upper eyelid. Fingers rather slender, the tips dilated, truncated; toes moderate, not dilated at the ends, with a slight rudiment of web; subarticular tubercles not very prominent; two small, scarcely prominent, metatarsal tubercles, the inner elongate. The tarso-metatarsal articulation hardly reaches the posterior border of the eye. Skin nearly smooth; a fold from the eye to the shoulder. Olive above, marbled with dark brown; belly whitish, immaculate. Male with a subgular vocal sac.

From snout to vent 1·4 inches.

Hab. Peninsular India as far north as the Godávari, and Ceylon.

98. Callula triangularis.

Callula triangularis, *Günth. P. Z. S.* 1875, p. 576; *Bouleng. Cat. Batr. Sal.* p. 171, pl. xiii, fig. 4.

Snout short, blunt, as long as the diameter of the orbit; interorbital space broader than the upper eyelid. Fingers moderate, the tips dilated into rather small truncated disks; toes moderate, perfectly free, the tips not dilated; subarticular tubercles well developed; two small metatarsal tubercles, inner largest, oval, blunt. The tarso-metatarsal articulation reaches the shoulder, or halfway between the latter and the eye. Skin smooth, or with some flat tubercles on the back; a fold from the eye to the shoulder, and another across the head behind the eyes. Light olive above, with a large triangular blackish spot occupying nearly the whole length of the back; sides and lower surfaces blackish brown, latter spotted with whitish; limbs blackish brown, with large light olive spots. Male with a subgular vocal sac.

From snout to vent 1·6 inches.

Hab. Nilgiris; Malabar.

Genus CACOPUS,

Günther, Rept. B. I. p. 415, 1864.

Fig. 135.—Pectoral arch of *Cacopus systoma*. (B. M. Catal. Batr. Sal.)

Pupil vertical. Tongue oval, entire and free behind. Choanæ very large, with a dermal movable flap, which can close the nostril; two small bony prominences, close together, between the hinder edges of the choanæ and on a level with them; a narrow denticulated dermal ridge across the parasphenoidal region, and another, very broad, in front of the œsophagus. Tympanum hidden or very indistinct. Fingers free;

toes webbed at the base, the tips not dilated. Outer metatarsals united. No præcoracoids; sternum a large cartilaginous plate. Diapophyses of sacral vertebra rather strongly dilated. Terminal phalanges simple.

Burrowing Batrachians, feeding chiefly on ants.

Synopsis of the Species.

Snout scarcely longer than diameter of orbit.... *C. systoma*, p. 496.
Snout nearly twice diameter of orbit .... *C. globulosus*, p. 497.

99. Cacopus systoma.

Rana systoma, *Schneid. Hist. Amph.* i, p. 144.
Uperodon marmoratum, *Dum. & Bibr. Erp. Gén.* viii, p. 749.
Cacopus systoma, *Günth. Rept. B. I.* p. 415; *Bouleng. Cat. Batr. Sal.* p. 174.

Habit very stout. Head small; mouth small; snout rounded, without canthus rostralis, as long as or slightly longer than the diameter of orbit; interorbital space twice or not quite twice the width of the upper eyelid. Fingers moderate, first a little shorter than second; toes rather short, webbed at the base; subarticular

Fig. 136.—*Cacopus systoma.*

tubercles rather indistinct; two strong, compressed, shovel-shaped metatarsal tubercles, inner very large, as long as the second toe. Skin smooth, upper surfaces sometimes tubercular. Olive or pinkish brown above, marbled with blackish brown; beneath whitish, immaculate. Male with a subgular vocal sac.

From snout to vent 2·5 inches.

Hab. India: Carnatic, Biligiriranga Hills, Mysore, Madras.

According to Thurston, this frog is sometimes found in large numbers at night in Madras compounds during the monsoon, emitting a characteristic sound. It is unfortunate that no observations have been made on the breeding-habits, which cannot but prove of great interest.

100. Cacopus globulosus.

Cacopus globulosus, *Günth. Rept. B. I.* p. 416, pl. xxvi, fig. K; *Bouleng. Cat. Batr. Sal.* p. 175.

Differs from the preceding in the following points:—Habit stouter still, globular; snout longer, measuring nearly twice the diameter of the orbit, with distinct but obtuse canthus rostralis; interorbital space three times the width of the upper eyelid; inner metatarsal tubercle longer than the second toe. Brown, uniform or spotted with darker.

From snout to vent 3 inches.

Hab. Russellkonda, Ganjam; Calcutta (*Anderson*).

Genus GLYPHOGLOSSUS,

Günther, P. Z. S. 1868, p. 483.

Pupil vertical. Tongue elongate, notched behind and in front, divided into two halves by a deep groove, extensively free behind, slightly so in front. A papilla in the median line of the hinder part of the palate; a denticulated cutaneous ridge across the palate, in front of the œsophagus. Tympanum hidden. Fingers free; toes webbed, the tips not dilated. No præcoracoids; sternum a cartilaginous plate. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges simple.

A single species.

101. Glyphoglossus molossus.

Glyphoglossus molossus, *Günth. P. Z. S.* 1868, p. 483, pl. xxxviii, fig. 1; *Bouleng. Cat. Batr. Sal.* p. 175.

Head very short, crown convex; mouth very narrow; no canthus rostralis; eye very small; the fleshy part of the lower jaw swollen, truncated in front, forming a semicircular disk. Limbs very short. Fingers short, pointed, first and second equal, fourth very short; toes short, pointed, entirely webbed; subarticular tubercles distinct; two metatarsal tubercles, the inner extremely large, compressed, sharp-edged, the outer small, rounded. Skin smooth (finely granulate). Uniform brownish olive above, sides and limbs finely marbled with brown; lower parts whitish, immaculate.

From snout to vent 2 inches.

Hab. Irrawaddy delta, Pegu.

This very curious frog strongly resembles the preceding, from which it is generically distinguished by the structure of the tongue. Like *Cacopus* it is probably an ant-eater, but no observations have yet been made on its habits. It is true that but a single specimen is known, which is preserved in the British Museum.

Family III. DYSCOPHIDÆ.

Upper jaw toothed; diapophyses of sacral vertebra dilated.

Of the 8 genera and 12 species known, all are inhabitants of Madagascar, with the exception of the Burmese *Calluella*.

Genus CALLUELLA,

Stoliczka, P. A. S. B. 1872, p. 146.

Pupil vertical. Tongue oval, entire and free behind. A transverse, interrupted series of palatine teeth. Two cutaneous folds across the palate in front of the œsophagus. Tympanum hidden. Fingers free, toes webbed, the tips not dilated. Outer metatarsals united. Coracoids strong; præcoracoids very weak, imperfectly ossified, resting upon coracoids; no omosternum; sternum a small cartilaginous plate. Diapophyses of sacral vertebra moderately dilated. Terminal phalanges simple.

Fig. 137.—Palate of *Calluella guttulata*.

A single species.

102. Calluella guttulata.

Megalophrys guttulata, *Blyth, J. A. S. B.* xxiv, 1855, p. 717.
Callula guttulata, *Günth. P. Z. S.* 1868, p. 490, pl. xl, fig. 1.
Calluella guttulata, *Stol. P. A. S. B.* 1872, p. 146; *Bouleng. Cat. Batr. Sal.* p. 181.

Head small; snout short, rounded; interorbital space broader than the upper eyelid. Fingers moderate, first a little shorter than second; toes moderate, not one-third webbed; tips of fingers and toes blunt; subarticular tubercles well developed; inner metatarsal tubercle large, shovel-shaped; outer metatarsal tubercle absent or indistinct. The tarso-metatarsal articulation reaches the eye. Skin perfectly smooth; a rather indistinct fold across the head, behind the eyes; another fold from the eye to the shoulder. Upper parts pink or yellowish olive, coarsely marbled with brown, the brown marks edged by a black line; a long transverse black mark across the vent and hinder surface of thighs; beneath immaculate, the male's throat blackish. Male with a subgular vocal sac.

From snout to vent 2 inches.

Hab. Pegu and Tenasserim.

Series B. **ARCIFERA.**

Family IV. BUFONIDÆ.

Jaws toothless; diapophyses of sacral vertebra dilated.

The family of true Toads, which is nearly cosmopolitan, is represented in the Indian Fauna by 3 genera.

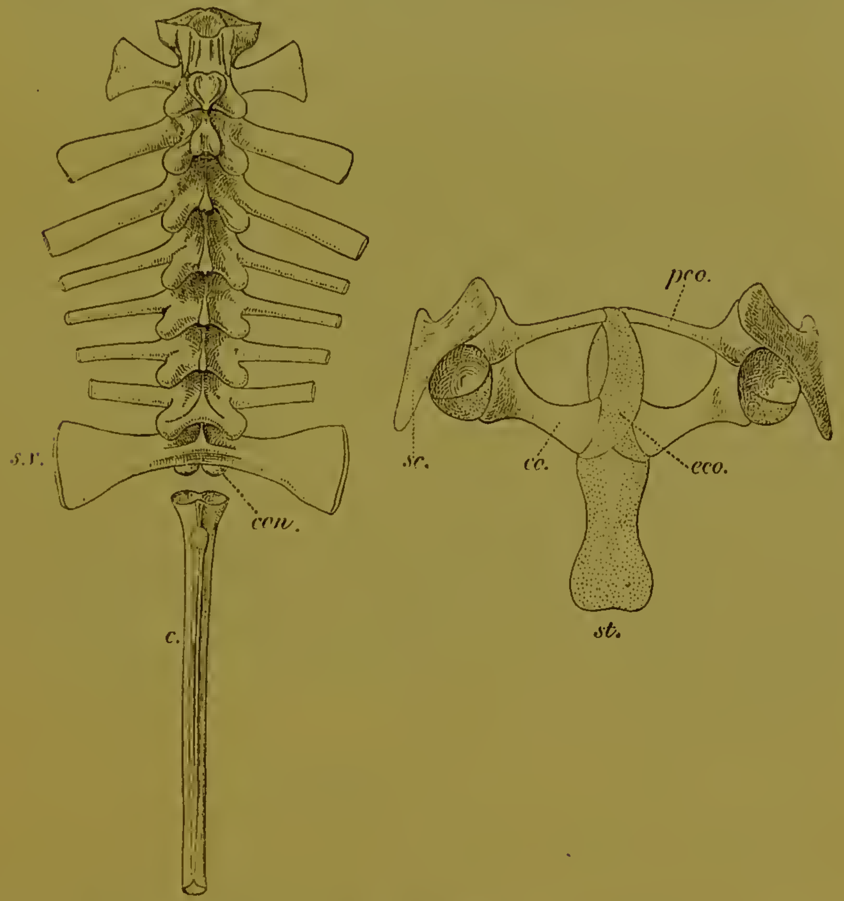

Fig. 138.—Vertebral column and pectoral arch of *Bufo asper*.

c. Coccyx.
co. Coracoid.
con. Sacral condyles.
eco. Epicoracoid.
pco. Præcoracoid.
sc. Scapula.
st. Sternum.
s.v. Sacral vertebra.

Synopsis of Indian Genera.

Tongue entire; pupil horizontal; fingers webbed	NECTOPHRYNE, p. 500.
Tongue entire; pupil horizontal; fingers free	BUFO, p. 500.
Tongue nicked behind; pupil vertical	COPHOPHRYNE, p. 508.

Genus NECTOPHRYNE,

Buchholz & Peters, MB. Ak. Berl. 1875, p. 202.

Pupil horizontal. Tongue elliptical, entire, free behind. Tympanum distinct or absent. Fingers and toes webbed, the tips dilated into regular disks. Outer metatarsal united. No omosternum; sternum cartilaginous. Diapophyses of sacral vertebra strongly dilated. Sacral vertebra articulating with coccyx by two condyles. Terminal phalanges T-shaped.

Distribution. One species inhabits the Cameroons, West Africa, a second Borneo, and a third Malabar.

103. Nectophryne tuberculosa.

Pedostibes tuberculosus, *Günth. P. Z. S.* 1875, p. 576, pl. lxiv, fig. C.
Nectophryne tuberculosa, *Bouleng. Cat. Batr. Sal.* p. 280.

Habit moderately slender. Head moderate; snout subacuminate; loreal region vertical; interorbital space as broad as the upper eyelid; tympanum distinct, one third the width of the eye. Fingers moderate, depressed, webbed at the base, first half the length of second; toes moderate, nearly entirely webbed; tips of fingers and toes dilated into broad truncated disks, those of toes rather smaller than those of fingers; subarticular tubercles small; two small, flat metatarsal tubercles; no tarsal fold. The hind limb being carried forwards along the body, the metatarsal tubercles reach to between the eye and tip of the snout. Skin of upper parts tubercular, the largest tubercles being arranged along each side of the back. Brownish grey above, sides darker; a white band from below the eye to the axil; another white longitudinal band in the lumbar region; beneath dark-spotted. Male with a subgular vocal sac.

From snout to vent 1·4 inches.

Hab. Malabar.

Genus BUFO,

Laurenti, Syn. Rept. p. 25 (part.), 1768.

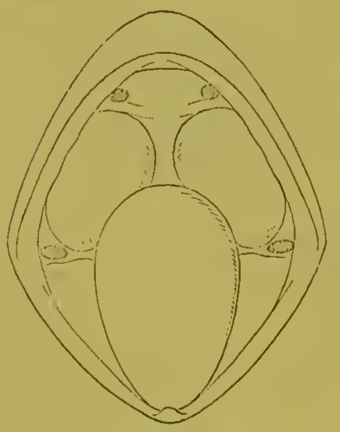

Fig. 139.
Open mouth of *Bufo asper*.

Pupil horizontal. Tongue elliptical or pyriform, entire, free behind. Tympanum distinct or hidden, seldom absent. Fingers free; toes more or less webbed; the tips simple or dilated into small disks. Outer metatarsals united. Omosternum generally absent; if present, cartilaginous; sternum a cartilaginous plate, sometimes more or less ossified along the median line. Diapophyses of sacral vertebra more or less dilated. Sacral vertebra articulating with coccyx by two condyles. Terminal phalanges obtuse or triangular.

Distribution. The true Toads form a large genus, about 85 species being known. They are found in every part of the world except Madagascar, Australia, New Guinea, and the Islands of the Pacific.

Synopsis of Indian, Ceylonese, and Burmese Species.

A. Head without bony ridges.
- *a.* First finger shorter than second.
  - *a'.* Parotoids none . . . . *B. pulcher*, p. 501.
  - *b'.* Parotoids narrow, elongate . . . . *B. kelaartii*, p. 502.
- *b.* First finger as long as second or longer.
  - *a'.* Tympanum as large as the eye and close to it.
    - *a''.* Skin smooth or nearly so . . . . *B. hololius*, p. 502.
    - *b''.* Skin rough, tubercular . . . . *B. macrotis*, p. 502.
  - *b'.* Tympanum smaller than eye.
    - *a''.* Tympanum very small or indistinct: no tarsal fold . . . . *B. beddomii*, p. 503.
    - *b''.* Tympanum about half diameter of eye; a tarsal fold.
      - *α.* Subarticular tubercles of toes double. *B. latastii*, p. 503.
      - *β.* Subarticular tubercles of toes single. *B. viridis*, p. 504.
    - *c''.* Greatest diameter of tympanum two thirds that of eye.
      - *α.* A tarsal fold . . . . *B. andersonii*, p. 504.
      - *β.* No tarsal fold . . . . *B. olivaceus*, p. 504.

B. Head with bony ridges.
- *a.* No parietal ridges; parotoids elliptical, elongate.
  - *a'.* Tympanum small.
    - *a''.* Cranial ridges rather indistinct . . . . *B. himalayanus*, p. 505.
    - *b''.* Cranial ridges very distinct . . . . *B. microtympanum*, [p. 505.
  - *b'.* Tympanum at least two thirds the diameter of the eye . . . . *B. melanostictus*, [p. 505.
- *b.* Parietal ridges.
  - *a'.* Tympanum two thirds diameter of eye. *B. parietalis*, p. 507.
  - *b'.* Tympanum as large as eye . . . . *B. biporcatus*, p. 507.
- *c.* No parietal ridges; parotoids short, roundish or subtriangular . . . . *B asper*, p. 507.

104. Bufo pulcher.

Ansonia ornata, *Günth. P. Z. S.* 1875, p. 568, pl. lxiii, fig. A.
Bufo pulcher, *Bouleng. Cat. Batr. Sal.* p. 288.

Habit slender. Crown without bony ridges; snout short, obliquely truncated, with angular canthus rostralis and vertical loreal region; interorbital space a little broader than the upper eyelid; tympanum distinct, about half the size of the eye. Fingers rather slender, first much shorter than second; toes short, nearly entirely webbed; subarticular tubercles single, not very prominent; tips of fingers and toes slightly swollen; metatarsal tubercles two, not very prominent; no tarsal fold. The hind limb being carried forwards along the body, the tibio-tarsal articulation

reaches to between the eye and the tip of the snout. Anterior half of the back finely tubercular, the remainder smooth; no parotoids. Black; upperside of head and a dorsal line generally grey; beneath with large bright yellow spots. Male with a subgular vocal sac.

From snout to vent 1·2 inches.

Hab. Brahmagiri Hills, Coorg.

105. **Bufo kelaartii.**

Bufo kelaartii, *Günth. Cat. Batr. Sal.* p. 140, pl. x, fig. A; *id. Rept. B. I.* p. 421; *Bouleng. Cat. Batr. Sal.* p. 288.
Bufo kandianus, *Günth. A. M. N. H.* (4) ix, 1872, p. 87.

Crown without bony ridges; snout rounded or slightly pointed; canthus rostralis angular; interorbital space as broad as the upper eyelid; tympanum small, rather indistinct. Fingers rather slender, first not extending as far as second; toes entirely webbed, with single subarticular tubercles; tips of fingers and toes swollen; two small metatarsal tubercles; tarsal fold present or absent. The tarso-metatarsal articulation reaches to between the eye and the tip of the snout. Skin covered with small tubercles; parotoids very narrow and rather elongate. Brownish above; a light cross-band between the eyes; beneath brown-spotted.

From snout to vent 1·75 inches.

Hab. Ceylon.

106. **Bufo hololius.**

Bufo hololius, *Günth. P. Z. S.* 1875, p. 569, pl. lxiv, fig. A; *Bouleng. Cat. Batr. Sal.* p. 289.

Crown without bony ridges; snout short, prominent; interorbital space as broad as the upper eyelid; tympanum very distinct, nearly as large as the eye and close to it. Fingers short, first extending a little beyond second; toes short, webbed at the base only; subarticular tubercles single, not very prominent; two small metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches the eye. Skin smooth, the back with very flat, smooth, distinctly porous glandular patches; parotoids flat. Olive above, marbled with brown; beneath immaculate.

From snout to vent 1·4 inches.

Hab. Malabar. A single specimen is known.

107. **Bufo macrotis.**

Bufo macrotis, *Bouleng. Ann. Mus. Genova,* (2) v, 1887, p. 422, pl. iv, fig. 3.

Crown without bony ridges; snout short, truncated; interorbital space flat, as broad as the upper eyelid; tympanum very distinct, vertically oval, quite as large as the eye and close to it. First finger a little longer than second; toes barely half webbed, with irregular

spinose tubercles beneath, from which the so-called subarticular are hardly distinguishable; two small metatarsal tubercles; no tarsal fold. The tarso-metatarsal tubercle reaches the tympanum or the eye. Upper parts studded with round tubercles of various sizes; parotoids prominent, subcircular. Grey-brown or olive above, with irregular dark brown spots, vertical bars on the upper lip, and cross bands on the limbs; lower surfaces dirty white, with darker spots; the male's throat brown. Male with a subgular vocal sac and, during the nuptial period, black rugosities on the two inner fingers.

From snout to vent 1·4 inches.

Hab. Bhámo, Teinzo, and Kakhyen Hills, Upper Burma.

108. Bufo beddomii.

Bufo beddomii, *Günth. P. Z. S.* 1875, p. 569; *Bouleng. Cat. Batr. Sal.* p. 289, pl. xix, fig. 1.
Bufo travancoricus, *Beddome, P. Z. S.* 1877, p. 685.

Crown without bony ridges; snout short, projecting, with angular canthus rostralis; interorbital space a little broader than the upper eyelid; tympanum very small, sometimes indistinct. First finger not extending beyond second; toes nearly entirely webbed, with single subarticular tubercles; two small metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches to between the eye and the tip of the snout. Upper parts covered with rough tubercles; parotoids ovate, about twice as long as broad, rather indistinct. Dark brown above, with indistinct black spots; limbs beautifully marbled with carmine; lower surfaces marbled with brown.

From snout to vent 1·75 inches.

Hab. Travancore Hills, 4000 feet.

109. Bufo latastii.

Bufo latastii, *Bouleng. Cat. Batr. Sal.* p. 294, pl. xix, fig. 2.

Crown without bony ridges; snout short, blunt; interorbital space narrower than the upper eyelid; tympanum very distinct, half the diameter of the eye. First finger not extending beyond second; toes two-thirds webbed, with double subarticular tubercles; two moderate metatarsal tubercles; a tarsal fold. The tarso-metatarsal articulation reaches the tympanum or the hinder border of the eye. Upper parts with irregular, depressed, distinctly porous warts; parotoids moderate, kidney-shaped; a parotoid-like gland on the calf. Olive above, spotted or marbled with blackish; a light vertebral band; beneath more or less spotted or marbled with blackish.

From snout to vent 2·2 inches.

Hab. Ladák.

110. Bufo viridis.

Bufo viridis, *Laur. Syn. Rept.* p. 27, pl. i, fig. 1; *Stol. J. A. S. B.* xxxix, 1870, pt. 2, p. 155; *id. P. A. S. B.* 1872, p. 113; *Bouleng. Cat. Batr. Sal.* p. 297.
Bufo calamita (*non Laur.*), *Günth. Rept. B. I.* p. 420.

Crown without bony ridges; snout short, rather blunt; interorbital space narrower than the upper eyelid; tympanum distinct, about half the diameter of the eye. First finger extending a little beyond second; toes half or two-thirds webbed, with single subarticular tubercles; two moderate metatarsal tubercles; a tarsal fold. The tibio-tarsal articulation usually reaches the eye. Upper parts with irregular, depressed, distinctly porous warts; parotoids very variable in shape and in size, generally moderately elongate and kidney-shaped. Olive or greenish, uniform or spotted or marbled with darker; beneath whitish, uniform or spotted with blackish. Male with a subgular vocal sac and black nuptial excrescences on the two inner fingers.

From snout to vent 3·5 inches.

Hab. Europe east of the Rhine and Rhone, North Africa, Western and Central Asia, Mongolia and Tibet; Himalayas. At the village of Gieumal Stoliczka found a specimen at about 15,000 feet, which is the highest locality from which a Batrachian was ever recorded.

111. Bufo andersonii.

Bufo pantherinus (*non D. & B.*), *Anders. P. Z. S.* 1871, p. 203.
Bufo andersonii, *Bouleng. A. M. N. H.* (5) xii, 1883, p. 163; *Murray, Zool. Sind,* p. 401.

Crown without bony ridges; snout short, blunt; interorbital space flat, a little broader than the upper eyelid; tympanum very distinct, round, two thirds the diameter of the eye. First finger extending as far as second or slightly beyond; toes two-thirds or half webbed, with single subarticular tubercles; two moderate metatarsal tubercles; a tarsal fold. The tarso-metatarsal articulation reaches between the shoulder and the eye. Upper parts with irregular flat warts; parotoids large, elliptical, flat. Brownish or olive-grey above, spotted or marbled with darker; beneath immaculate. Male with a subgular vocal sac.

From snout to vent 3 inches.

Hab. Agra, Rajputana, Sind, Muscat in Arabia.

112. Bufo olivaceus.

Bufo olivaceus, *Blanf. A. M. N. H.* (4) xiv, 1874, p. 35; *id. Zool. E. Pers.* p. 434, pl. xxviii, fig. 3; *Bouleng. Cat. Batr. Sal.* p. 300.

Crown without bony ridges; snout short, obliquely truncated from above backwards; interorbital space slightly concave, a little broader than the upper eyelid; tympanum very distinct, vertically oval, its greatest diameter two thirds that of the eye. Fingers moderate, first

longer than second; toes moderate, two-thirds webbed; subarticular tubercles single; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches in front of the eye. Skin of upper parts nearly smooth; parotoids depressed, very large, extending to the sacral region; a fold across the occipital region. Uniform olive above, whitish beneath. Male with a subgular vocal sac.

From snout to vent 2·6 inches.

Hab. Baluchistan.

113. Bufo himalayanus.

Bufo melanostictus, var. himalayanus, *Günth. Rept. B. I.* p. 422.
Bufo sikkimensis, part., *Stoliczka, P. A. S. B.* 1872, p. 112: *Bouleng. Cat. Batr. Sal.* p. 305.
Bufo himalayanus, *Bouleng. l. c.* p. 305, pl. xx.

Crown deeply concave, with low, blunt supraorbital ridges; snout short, blunt; interorbital space broader than the upper eyelid; tympanum very small, rather indistinct. First finger not extending beyond second; toes half or two thirds webbed, with single subarticular tubercles; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches the anterior border of the eye or the tip of the snout. Upper parts with irregular, distinctly porous warts; parotoids very prominent, large, elongate, at least as long as the head. Uniform brown. Male without vocal sacs.

From snout to vent 5 inches.

Hab. Himalayas (Nepal, Sikhim).

114. Bufo microtympanum.

Bufo microtympanum, *Bouleng. Cat. Batr. Sal.* p. 307, pl. xxii, fig. 1.

Head with prominent bony ridges, viz. a canthal, a præorbital, a supraorbital, a postorbital, and a short orbito-tympanic; snout short, blunt; interorbital space broader than the upper eyelid; tympanum very small, not half the diameter of eye, generally indistinct. First finger extending beyond second; toes about half webbed, with single subarticular tubercles; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches the eye, or between the eye and the tip of the snout. Upper surfaces with irregular, distinctly porous warts; parotoids prominent, elliptical, twice or twice and a half as long as broad. Brown above; yellow beneath, marbled with brown. Male with a subgular vocal sac.

From snout to vent 3 inches.

Hab. Malabar.

115. Bufo melanostictus.

Bufo melanostictus, *Schneid. Hist. Amph.* i, p. 216; *Günth. Rept. B. I.* p. 422: *Bouleng. Cat. Batr. Sal.* p. 306.

Head with more or less elevated bony ridges, viz. a canthal, a præorbital, a supraorbital, a postorbital, and a short orbito-tympanic; snout short, blunt; interorbital space much broader than the upper eyelid; tympanum very distinct, at least two thirds the diameter of the eye. First finger extending generally, but not always, beyond second; toes at least half webbed, with single subarticular tubercles; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches the tympanum or the eye. Upper surfaces with more or less prominent, often spiny, warts; parotoids very prominent, kidney-shaped or elliptical, more or less elongate.

Fig. 140.—*Bufo melanostictus.*

Yellowish or brownish above, the spines of the warts and the ridges of the head generally black; beneath immaculate or more or less spotted. Male with a subgular vocal sac, and black nuptial excrescences on the two inner fingers.

From snout to vent 6·5 inches.

Hab. This is the commonest toad throughout India, Ceylon, and Burma, ascending the Sikhim Himalayas to about 10,000 feet and to 7000 feet in the Nilgiris. Its range extends to Southern China and the Malay Peninsula and Archipelago.

116. Bufo parietalis.

Bufo parietalis, *Bouleng. Cat. Batr. Sal.* p. 312, pl. xxi, fig. 2.

Head with very prominent ridges, viz. a canthal, a slight præorbital, a supraorbital, a postorbital, a parietal, and an orbito-tympanic; parietal ridges obliquely directed inwards; snout short, blunt; interorbital space broader than the upper eyelid; tympanum distinct, two thirds the diameter of the eye. First finger extending beyond second; toes half webbed, with single subarticular tubercles; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches between the eye and the tip of the snout. Upper surfaces covered with irregular warts; parotoids moderately elongate, elliptical, very prominent. Uniform brown above; beneath marbled with brown. Male with a subgular vocal sac.

From snout to vent 3·25 inches.

Hab. Malabar.

117. Bufo biporcatus.

Bufo biporcatus, *Gravenh. Delic. Mus. Zool. Vratisl.* p. 53; *Bouleng. Cat. Batr. Sal.* p. 311.

Crown with bony ridges, viz. a supraorbital and a parietal, forming together a straight or nearly straight line, and a short orbito-tympanic; snout short, subacuminate, with prominent canthus rostralis; interorbital space a little broader than the upper eyelid; tympanum very distinct, as large as the eye. First finger usually not extending beyond second; toes half or two-thirds webbed, with single subarticular tubercles; two moderate metatarsal tubercles; no tarsal fold. The tarso-metatarsal articulation reaches the tympanum or the eye. Upper surfaces with very prominent, conical, spinous tubercles; parotoids very prominent, small, subtriangular or oval. Brownish above, marbled with darker; beneath more or less spotted with brown. Male with a subgular vocal sac.

From snout to vent 3 inches.

Hab. Java and Borneo. Recently found in the mountains of Tenasserim by M. Fea.

118. Bufo asper.

Bufo asper, *Gravenh. Delic. Mus. Zool. Vratisl.* p. 58; *Günth. Rept. B. I.* p. 423; *Bouleng. Cat. Batr. Sal.* p. 313.

A broad supraorbital and a thick orbito-tympanic bony ridge; snout short, obliquely truncated; canthus rostralis angular; loreal

region vertical; interorbital space broader than the upper eyelid; tympanum distinct, one third the diameter of the eye. First finger not extending beyond second; toes entirely webbed, with single subarticular tubercles; two moderate metatarsal tubercles; a tarsal fold. The tarso-metatarsal articulation reaches the tip of the snout or beyond. Upper surfaces with very prominent, conical, spinose tubercles; parotoids very prominent, small, subtriangular or roundish. Uniform brown or blackish above; beneath whitish, immaculate or spotted with black. Male with an internal subgular vocal sac.

From snout to vent 6 inches.

Hab. Tenasserim (Mergui), Malay Peninsula, Sumatra, Borneo, Java.

Genus **COPHOPHRYNE**,

Boulenger, A. M. N. H. (5) xx, 1887, p. 406.

Pupil vertical. Tongue elliptical, free and very slightly nicked behind. No tympanum; eustachian tubes extremely small, scarcely perceptible. Fingers free, toes nearly free, the tips not dilated. Outer metatarsals united. A cartilaginous omosternum; sternum with a slender bony style. Sacral vertebra with very strongly dilated diapophyses, and one condyle for articulation with coccyx.

A single species.

119. Cophophryne sikkimensis.

Bombinator sikkimmensis, *Blyth, J. A. S. B.* xxiii, 1854, p. 300.
Scutiger sikkimmensis, *Theob. Cat. Rept. As. Soc. Mus.* 1868, p. 83.
Bufo sikkimmensis, *Anders. P. Z. S.* 1871, p. 204.
Cophophryne sikkimensis, *Bouleng. A. M. N. H.* (5) xx, 1887, p. 406.

Head moderate; snout short, rounded, with indistinct canthus rostralis; interorbital space a little narrower than the upper eyelid. Fingers and toes blunt, without subarticular tubercles; first and second fingers equal; an indistinct rudiment of web between the toes; a large, elliptical, very feebly prominent inner metatarsal tubercle; no tarsal fold. The tibio-tarsal articulation reaches the shoulder or the angle of the mouth. Upper parts with large porous warts, which may form irregular longitudinal series on the back; a narrow parotoid gland, ill-defined above, extends obliquely from the eye to the extremity of the jaws; lower parts perfectly smooth. Olive-brown above, the warts darker and dotted with lighter; a light triangular spot on the forehead, the base between the eyes, the apex touching the lip; loreal region dark; limbs with dark marblings. Male without vocal sacs; during the breeding-season with two plate-like callosities on either side of the thorax, thickly

studded with minute dark-brown points, and similar rugosities on the three inner fingers.

From snout to vent 2 inches.

Hab. A rare Batrachian, hitherto recorded only from Sikhim, reaching an altitude of 13,000 feet.

Family V. HYLIDÆ.

Upper jaw toothed; diapophyses of sacral vertebra dilated; distal phalanges claw-like, swollen at the base.

The *Hylidæ* are arboreal frogs, very abundantly represented in America and Australia and by a few species in the Palæarctic region. The species described below is to be regarded as an outpost from the fauna of the latter region.

Genus **HYLA**,

Laurenti, Syn. Rept. p. 32 (part.), 1768.

Pupil horizontal. Tongue entire or slightly nicked, adherent or more or less free behind. Vomerine teeth. Tympanum distinct or hidden. Fingers free or more or less webbed; toes webbed, the tips dilated into smaller or larger disks. Outer metatarsals united or slightly separated. Omosternum cartilaginous; sternum a cartilaginous plate. Diapophyses of sacral vertebra more or less dilated.

Distribution. About 150 species are known, from America, Australia, Papuasia, and the Palæarctic region.

120. **Hyla annectens.**

Polypedates annectens, *Jerdon, P. A. S. B.* 1870, p. 84.
Hyla annectens, *Günth. P. Z. S.* 1875, p. 576; *Bouleng. Cat. Batr. Sal.* p. 382.

Tongue circular, slightly nicked, and free behind. Vomerine teeth in two groups on a level with the hinder edge of the choanæ. Head broader than long; snout short, rounded; canthus rostralis distinct; interorbital space as broad as the upper eyelid; tympanum distinct, about half the diameter of the eye. Fingers webbed at the base; toes two-thirds webbed; disks well developed. The tibio-tarsal articulation reaches the tympanum or the eye. Skin smooth above, granular beneath; a strong tuberculated fold from the eye to the shoulder. Green above; a dark, lateral streak, light-edged above, ending in two or three deep black spots, separated or confluent on the groin, which is bright yellow; sides of thighs with deep black spots on a bright yellow ground; two outer fingers and

two outer toes green; beneath whitish, immaculate. Male with an external subgular vocal sac and black nuptial excrescences on the thumb.

From snout to vent 2 inches.

Hab. Khási Hills, and Kakhyen Hills, Upper Burma.

Family VI. PELOBATIDÆ.

Upper jaw toothed; diapophyses of sacral vertebra strongly dilated; terminal phalanges simple.

Of the 8 genera of this family, only one is found in India and Burma. The statement, made in several works, that a species of *Megalophrys* (*M. montana*, Kuhl), occurs in Ceylon is based on a specimen in the British Museum purchased from a dealer many years ago. In the absence of further data, I consider the locality attached to that specimen as probably erroneous.

Genus **LEPTOBRACHIUM**,

Tschudi, Class. Batr. p. 81, 1838.

Pupil vertical. Tongue large, cordiform or pyriform, slightly nicked and free behind. Vomerine teeth present or absent. Tympanum indistinct or hidden. Fingers free; toes webbed at the base or nearly free, the tips not dilated. Outer metatarsals united. Omosternum cartilaginous; sternum with a bony style. Vertebræ procœlous. Sacral vertebra with very strongly dilated diapophyses, and one condyle for articulation with coccyx.

Distribution. Four species are known from Burma and the Eastern Himalayas. A fifth (*L. gracile*, Gthr.) is from Borneo.

Synopsis of Indian and Burmese Species.

A. Tibio-tarsal articulation reaching the eye, or beyond; vomerine teeth .... *L. monticola*, p. 510.

B. Tibio-tarsal articulation not reaching the eye.
- *a.* Vomerine teeth none; no palpebral appendage .... *L. hasseltii*, p. 511.
- *b.* Vomerine teeth none; several palpebral appendages .... *L. carinense*, p. 511.
- *c.* Vomerine teeth; a single palpebral appendage .... *L. feæ*, p. 512.

121. **Leptobrachium monticola.**

Xenophrys monticola, *Günth. Rept. B. I.* p. 414, pl. xxvi, fig. H; *Bouleng. Cat. Batr. Sal.* p. 441.
Xenophrys gigas, *Jerdon, P. A. S. B.* 1870, p. 85.
Ixalus cinerascens, *Stoliczka, P. A. S. B.* 1870, p. 275.
Ixalus lateralis, *Anders. J. A. S. B.* xl, 1871, p. 29; *id. An. Zool. Res. Yunnan*, p. 844, pl. lxxviii, fig. 5.

Leptobrachium monticola, *Bouleng. Ann. Mus. Genova*, (2) vii, 1889, p. 720.

Tongue cordiform. Vomerine teeth in two small groups a little behind the choanæ. Head much depressed; snout very short, truncated, with angular canthus rostralis and deeply concave loreal region; interorbital space broad, slightly concave; tympanum scarcely distinct, vertically oval, about two thirds the diameter of the eye. First finger not extending beyond second; toes with a rudiment of web; tips of fingers and toes slightly swollen; subarticular and metatarsal tubercles indistinct. The tibio-tarsal articulation reaches the eye, the tip of the snout, or a little beyond the latter. Skin smooth or minutely tubercular above; usually a V-shaped linear ridge on the nape. Olive-brown above; a dark, light-edged triangular spot between the eyes; usually one or two other angular markings on the back, and a dark band along each side of the head; hind limbs with dark cross bars; throat and breast marbled with brown. Male with internal vocal sacs.

From snout to vent 4 inches.

Hab. Sikhim, Khási Hills, mountains of Burma. This frog occurs also at Kiu-Kiang, on the Yang-tse-kiang, whence Dr. Boettger received a young specimen, which I have examined.

122. Leptobrachium hasseltii.

Leptobrachium hasseltii, *Tschudi, Class. Batr.* p. 81; *Bouleng. Cat. Batr. Sal.* p. 441.

Tongue cordiform. Vomerine teeth none. Head rather large; snout rounded, as long as the diameter of the orbit, with distinct canthus rostralis; interorbital space a little broader than the upper eyelid; tympanum very indistinct, half the diameter of the eye. Fingers moderate, first and second equal; toes very short, webbed at the base; tips of fingers and toes blunt; subarticular tubercles indistinct; a small, subcircular, inner metatarsal tubercle. The tibio-tarsal articulation reaches the angle of the mouth. Skin of back distinctly, of belly indistinctly granular. Brownish or olive above, spotted with black; hind limbs with black cross bars. Male with a subgular vocal sac.

From snout to vent 2·5 inches.

Hab. Pegu and Tenasserim, Malay Peninsula, Sumatra, Borneo, Java.

123. Leptobrachium carinense.

Leptobrachium carinense, *Bouleng. Ann. Mus. Genova*, (2) vii, 1889, p. 748.

Tongue large, pyriform, slightly nicked posteriorly. Vomerine teeth none. Head enormous, nearly twice as broad as long, extremely depressed, semicircular in outline; the length of the snout equals the diameter of the eye; nostril equally distant from the

eye and from the middle of the upper lip; interorbital space nearly twice as broad as the upper eyelid, scarcely concave; loreal region slightly concave; canthus rostralis well-marked; temporal region very oblique; no distinct tympanum. Habit very stout, limbs short. Fingers and toes short, with slightly swollen tips; first finger not extending beyond second; toes one-third webbed; no subarticular tubercles; a very large, oval, flat inner metatarsal tubercle. The tibio-tarsal articulation reaches the axilla in the female, the angle of the mouth in the male; the tarso-metatarsal articulation reaches the angle of the mouth in the female, the posterior border of the orbit in the male. Sides of body with irregular flat warts; an oblique dermal ridge, directed outwards and backwards, on each side of the anterior half of the back, some irregular ridges or small scattered tubercles on the posterior half; a strong dermal ridge from the eye to the shoulder; upper eyelid with two to four horns, or long conical tubercles; stellate bony deposits in the skin of the parietal region and of the anterior part of the back; a transverse fold separates the head from the body; slight oblique dermal ridges across the limbs; throat finely granulate, belly nearly smooth. Yellowish, with the back between the dermal ridges purplish grey; the eyes, the dorsal ridges, and the larger lateral tubercles bordered with black, a blackish streak across the interorbital region; some of the latter tubercles pure white; limbs purplish grey, hands and feet carneous; gular region purplish black. Male with an internal vocal sac.

From snout to vent $6\frac{1}{2}$ inches.

Hab. M. Fea obtained several specimens of this frog on the Western slope of the Karennee Mountains, east of Toungngoo, at an altitude of 2500 feet and upwards. The strong jaws of this Batrachian enable it to overpower small mammalia, and a large female opened by M. Fea contained, in addition to a few insects, a small squirrel.

124. Leptobrachium feæ.

Megalophrys feæ, *Bouleng. Ann. Mus. Genova,* (2) iv, 1887, p. 512, and v, 1887, p. 423, pl. v.
Leptobrachium feæ, *Bouleng. op. cit.* vii, 1889, p. 750.

Tongue broadly pyriform, feebly nicked behind. Vomerine teeth in two small, widely separated groups behind the line of the choanæ. Head enormous, nearly twice as broad as long, extremely depressed, regularly semicircular in outline; the length of the snout hardly equals the diameter of the eye; nostril equally distant from the eye and from the middle of the upper lip, which does not project beyond the lower; interorbital space twice as broad as the upper eyelid, scarcely concave; loreal region concave, canthus rostralis feeble; temporal region very oblique; no distinct tympanum. Fingers rather short, first not extending beyond second. Toes short, with a very short web at the base; no distinct subarticular tubercles; a very large, oval, flat inner metatarsal tubercle. The

tibio-tarsal articulation reaches the axilla or the commissure of the jaws. Sides of body and upper surface of limbs with small smooth warts; no longitudinal glandular folds; a fold from the eye to the commissure of the jaws; upper eyelid with small smooth warts and a long conical tubercle or horn near its outer edge; a group of stellate bony deposits on each side of the parietal region; smaller dermal ossifications crowded on the anterior part of the back; lower parts smooth. Olive-brown above, temporal region darker; lips, eyes, and some of the larger warts on the body edged with black; a cross line between the orbits divides the head into a lighter anterior and a darker posterior portion; the warts on the upper surface of the thighs whitish; lower surfaces dirty white, chin blackish. Male with a subgular vocal sac.

From snout to vent 5·5 inches.

Hab. Discovered by M. Fea in the Kakhyen Hills, east of Bhámo.

Order II. CAUDATA.

Four (or two) limbs and a tail throughout life. Propodial bones distinct. Frontal bones distinct from parietals; palatines distinct from maxillaries.

In the tailed Batrachians the metamorphoses are less conspicuous than in the Frogs and Toads, and some forms even retain the gills permanently (*Proteidæ*, *Sirenidæ*). This order is essentially confined to the Palæarctic and North-American Regions, but a few species extend, favoured by elevation, into the mountains of the Neotropical and Indian regions. In the latter region two species occur—an *Amblystoma* in the mountains of Siam and the curious genus *Tylototriton*, described below.

Family I. SALAMANDRIDÆ.

No gills in the perfect state; maxillary present; both jaws toothed; eyelids developed.

Genus TYLOTOTRITON,

Anderson, P. Z. S. 1871, p. 423.

Tongue small, subcircular, free on the sides and slightly behind. Palatine teeth in two oblique series, meeting in front. A thick,

bony fronto-squamosal arch; maxillary reaching quadrate; pterygoid applied to maxillary. Toes five. Tail compressed.

A single species.

125. Tylototriton verrucosus.

Tylototriton verrucosus, *Anders. P. Z. S.* 1871, p. 423; *id. An. Zool. Res. Yunnan*, p. 848, pl. lxxvi, fig. 6, & pl. lxxvii; *Bouleng. Cat. Batr. Grad. &c.* p. 29.

Palatine series of teeth forming a Λ, commencing on a line with, or a little in front of, the choanæ. Head broader than long, surrounded by a prominent osseous porous ridge; a short similar ridge along the parietals; snout short, broad; eyes moderate; no labial lobes. Body 3 to $3\frac{1}{2}$ times the length of the head; no dorsal crest, but a broad prominent porous vertebral ridge, produced by the great development and transverse expansion of the neural processes of the dorsal vertebræ; a series of 15 or 16 knob-like porous glands along the side, the last three behind the leg when it is extended at right angles to the body. Limbs moderate; fingers and toes free, depressed. Tail as long as head and body or a little longer,

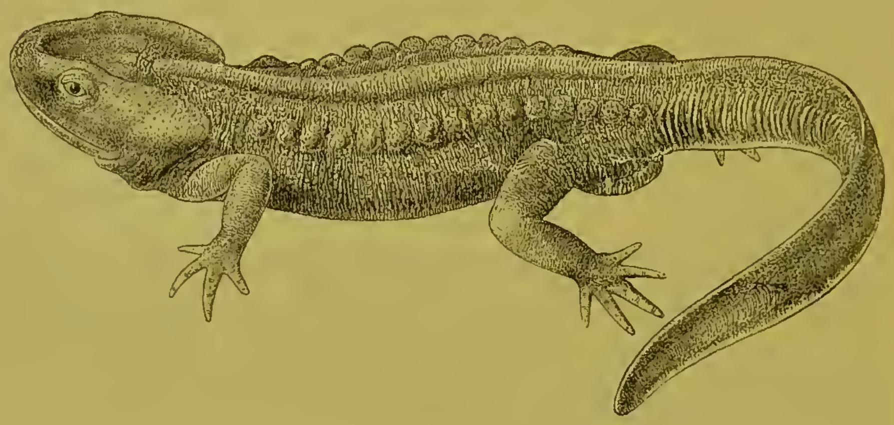

Fig. 141.—*Tylototriton verrucosus.*

strongly compressed, with an upper and lower crest, ending in a point. Anal opening a longitudinal slit, the borders not much swollen. Skin tubercular; parotoids large, very distinct; a strong gular fold. Uniform blackish brown, paler on the lips, snout, chin, throat, and under surface of limbs; lower edge of tail orange-yellow.

Total length 6 inches; tail 3.

Hab. Mountains of Yunnan, Kakhyen Hills, Sikhim.

Order III. APODA.

No limbs. Tail rudimentary or absent. Frontal bones distinct from parietals; palatines fused with maxillaries. Males with an intromittent copulatory organ.

A single family:—

Family I. CÆCILIIDÆ.

Worm-like, burrowing Batrachians inhabiting the Æthiopian*, Indian, and Neotropical Regions. 14 genera are known, three of which are represented in the Indian Fauna.

Synopsis of Indian Genera.

A. Cycloid imbricated scales imbedded in the skin; eyes distinguishable.
  a. Tentacle between the nostril and the eye, near the lip . . . . ICHTHYOPHIS, p. 515.
  b. Tentacle below the nostril . . . . URÆOTYPHLUS, p. 517.
B. No scales; eyes below the cranial bones. GEGENOPHIS, p. 518.

Genus ICHTHYOPHIS,

Fitzinger, N. Class. Rept. p. 36, 1826.

Squamosal bones in contact with parietals. Two series of teeth in the lower jaw. Tentacle cultriform, exsertile, between the eye and the nostril. Cycloid scales imbedded in the skin.

Distribution. India to the Malay Archipelago. Two species are known.

Synopsis of the Species.

Length of snout equals width of head between eyes; a yellow lateral band . . . . *I. glutinosus*, p. 515.
Length of snout less than width of head between eyes; uniform brown . . . . *I. monochrous*, p. 517.

126. Ichthyophis glutinosus.

Cæcilia glutinosa, *Linn. Syst. Nat.* i, p. 393.
Epicrium glutinosum, *Günth. Rept. B. I.* p. 441.
Ichthyophis glutinosus, *Bouleng. Cat. Batr. Grad. &c.* p. 89.

Both rows of mandibular teeth well developed. Snout rounded; the width of the head between the eyes equals the distance of the

* None are known from Madagascar, but two species occur in the Seychelles.

eye from the end of the snout; eye easily distinguishable; tentacle below and in front of the eye, usually much nearer to the eye than to the nostril. Body subcylindrical, rather depressed, moderately elongate, with very numerous (240 to 400) distinct circular folds, angular on the belly. Tail very short though distinct, pointed. Dark brown or bluish black; a yellow band along each side of the body.

Total length 15 inches; diameter of body ½ inch.

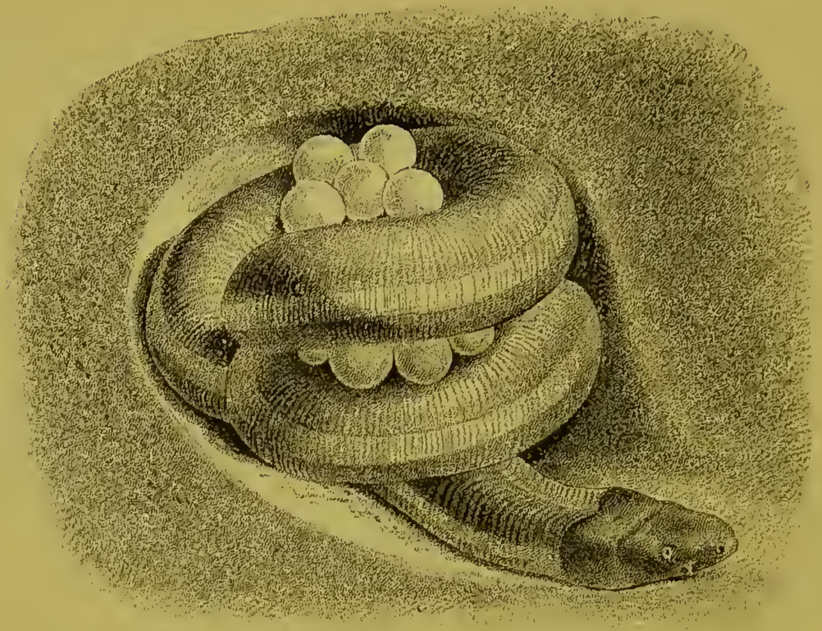

Fig. 142.—*Ichthyophis glutinosus*, female with eggs (after Sarasin).

Hab. Mountains of Ceylon, Malabar, Eastern Himalayas, Khási Hills, Burma, Siam, Malay Peninsula, Sumatra, Borneo, Java.

These Batrachians are found in damp situations, usually in soft mud. The complete development has been observed and described by the Drs. Sarasin *. The eggs are very large and deposited in a burrow near the water. The female protects them by coiling herself round the egg-mass, which the young do not leave until after the loss of the external gills; they then lead an aquatic life, and are provided with an opening, or spiraculum, on each side of the neck. In these larvæ the head is fish-like, provided with much developed labial lobes, with the eyes much more distinct than in the perfect animal; the tail is very distinct, strongly compressed, and finned above and beneath; the anal opening is a longitudinal cleft.

* Ergebnisse naturwissenschaftlicher Forschungen auf Ceylon in den Jahren 1884–86: ii, 1887–90.

127. Ichthyophis monochrous.

Ichthyophis glutinosus, var., *Cantor, J. A. S. B.* xvi, 1847, p. 1058.
Epicrium monochroum, *Bleek. Nat. Tijdschr. Nederl. Ind.* xvi, 1858, p. 188; *Günth. Rept. B. I.* p. 443.
Ichthyophis monochrous, *Bouleng. Cat. Batr. Grad. &c.* p. 91, pl. iv, fig. 1.

Differs from *I. glutinosus* in the following characters:—Head shorter, the distance between the eyes being more than the length of the snout. Inner series of mandibular teeth indistinct, composed of a few teeth only. 235 to 360 circular folds. Uniform blackish brown or lead-coloured, without lateral band.

Total length 13 inches; diameter of body ½ inch.

Hab. Java, Borneo, Singapore, Sikhim, and Western Ghâts of India; specimens were obtained in Malabar by Col. Beddome, and I have recently received from Mr. Gleadow a fine specimen obtained at Waghei, Surat.

Genus URÆOTYPHLUS.

Peters, MB. Ak. Berl. 1879, p. 933.

Squamosals free from parietals. Teeth small, numerous in jaws and palate; two series in the lower jaw. Eyes visible. Tentacle cultriform, exsertile, below the nostril. Cycloid scales imbedded in the skin.

Distribution. Two species from Southern India, and one from West Africa.

Synopsis of Indian Species.

Snout as long as the distance between the eyes; 200–210 folds round the body....	*U. oxyurus*, p. 517.
Snout longer than the distance between the eyes; 240–260 folds round the body....	*U. malabaricus*, p. 518.

128. Uræotyphlus oxyurus.

Cæcilia oxyura, *Dum. & Bibr. Erp. Gén.* viii, p. 280; *Günth. Rept. B. I.* p. 443.
Uræotyphlus oxyurus, *Bouleng. Cat. Batr. Grad. &c.* p. 92, pl. v, fig. 2.

Teeth small, subequal; both rows of mandibular teeth well developed. Snout narrowed, rounded; the width of the head between the eyes equals the distance of the eyes from the end of the snout; tentacle small, below the nostril, close to the lip; eyes easily distinguishable. Body cylindrical, moderately elongate, with numerous (200 to 210) distinct circular folds, widely interrupted on the belly (except those on the hindermost part of the body), alternately longer and shorter. Tail very short, though distinct, pointed. Blackish or purplish brown, lighter (sometimes white) beneath; lips and folds on the sides lighter.

Total length 11 inches; diameter of body 0·5.

Hab. Hills of Malabar.

129. Uræotyphlus malabaricus.

Cæcilia malabarica, *Beddome, Madras Journ. Med. Sc.* 1870, p. 176.

Uræotyphlus malabaricus, *Bouleng. Cat. Batr. Grad. &c.* p. 92, pl. v, fig. 3.

Well distinguished from the preceding by the following characters:—Snout narrower, more prominent, measuring more than the distance between the eyes. Plicæ more numerous (240 to 260), very narrowly interrupted on the belly. Dark olive-brown, a little lighter beneath; lips and end of snout yellowish.

Total length 9 inches; diameter of body 0·3.

Hab. Hills of Malabar.

Genus GEGENOPHIS,

Peters, MB. Ak. Berl. 1879, p. 932.

Squamosals in contact with parietals. Two series of teeth in the lower jaw. Eyes roofed over by bone. Tentacle globular, surrounded by a circular groove, situated behind and below the nostril. No scales.

A single species.

130. Gegenophis carnosus.

Epicrium carnosum, *Beddome, Madras Journ. Med. Sc.* 1870, p. 176.

Gegenophis carnosus, *Bouleng. Cat. Batr. Grad. &c.* p. 101, pl. viii, fig. 3.

Teeth small, subequal. Snout narrowed, projecting; tentacle near the lip. Body elongate; 115 to 120 circular folds, all rather indistinct, interrupted on the back, the hindermost complete. Tail indistinct, rounded. Uniform bright fleshy colour when alive; light brown in spirits, head yellowish.

Total length 7 inches; diameter of body 0·2.

Hab. Peria peak, Wynaad, at an elevation of about 5000 feet under stones; rare.

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